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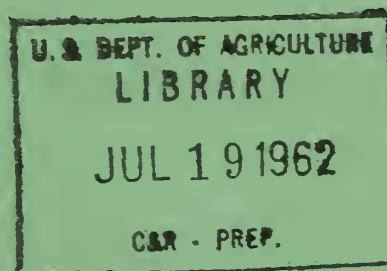


*Report of*

# **NORTHEAST DAIRY HOUSING WORKSHOP**

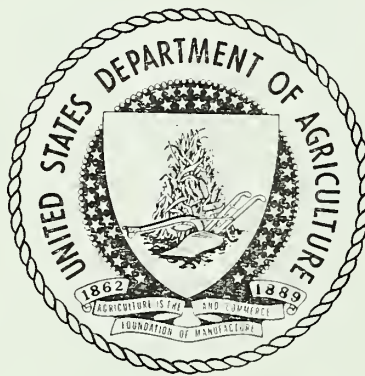
An inter-disciplinary and inter-state  
approach to strengthening  
Extension's educational leadership.

Poughkeepsie, New York  
March 28-30, 1962



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This is more than a report on dairy housing and milk handling. We recommend it for careful study and thought by anyone interested in a cooperative approach by specialists to a well-coordinated educational program in a specific problem area.

On March 28-30, 1962, a conference of extension representatives from the 12 Northeast States and USDA was held in Poughkeepsie, New York, to consider how to strengthen Extension's educational leadership in connection with the housing and milk handling problems of dairymen in the Northeast.

The conference brought together the disciplines of agricultural engineering, dairy science, and farm management; representation from extension administration, State program leaders, and county agricultural agents; and consultants from commercial firms and public agencies.

It is not possible to convey in the form of a report the interest expressed by those in attendance, the information obtained, the points of view exchanged, or the inspiration and helpful thoughts taken away for application in the respective State programs.

The committee is pleased, however, to make available an assembly and digest of the papers presented at the workshop. They have been arranged as they relate to (1) strengthening Extension's leadership role, (2) the efficient use of educational resources, and (3) future considerations concerning dairy housing in the Northeast.

The Northeast Dairy Housing  
and Milk Handling Committee

Geo. A. Ecker, Connecticut, Chairman  
Joe S. Taylor, Pennsylvania  
Joe T. Clayton, Massachusetts  
R. P. Davison, Vermont  
William Barr, Pennsylvania  
R. W. Kleis, Massachusetts  
Milton E. Hislop, New York  
L. M. Vaughan, USDA

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## EXTENSION'S EDUCATIONAL LEADERSHIP ROLE

In this section of the report you will find papers on the need for and purpose of strengthening Extension's leadership, progress being made, suggestions on how to do a better job, and opportunities yet to be developed.

### STRENGTHENING EXTENSION'S ROLE IN DAIRY HOUSING PROBLEMS THROUGH INTER-DISCIPLINARY COOPERATION

R. P. Davison, Director  
Vermont Extension Service  
University of Vermont

The Extension Service from its inception and until very recently has been operated very much on a project basis with each discipline carrying out projects peculiar to that discipline with little regard as to the relationship to other projects and other disciplines. This type of an approach to educational work was fine in the early days of our work and in fact did not really become outmoded until after World War II or about mid-century.

Most of our State extension services have already or will very shortly be building their Extension Service educational programs around problems rather than projects and in so doing will, of necessity, involve more than one discipline in the successful solution of these problems for farm and rural people.

Dairy housing and milk handling problems are one very good example of this current situation in the farming industry here in the Northeast. Since World War II there has been a real revolution on our dairy farms and much of it has centered around factors that lead directly to housing of dairy cattle and the handling of milk at the farm level.

Dairy farms are becoming fewer in the Northeast, but at the same time those remaining are larger, very highly mechanized, and striving for a high degree of efficiency. And, of course, one of the very important areas of cost on these farms is dairy housing and milk handling structures.

The problem of dairy housing is part of the whole farm firm production complex. Dairy housing is a necessity for it serves as a center of production where certain inputs can be combined to produce a product -- in this case, milk. Once the size, form, and location of this production center has been established, the problem of capital fixity arises.

Housing technology has changed materially in the past 15 years, and several types of new equipment have been made available. With declining profit margins and the increased emphasis on quality milk production, dairymen must make major changes in housing and milk handling facilities if they are to increase production efficiency and maintain a market for their product.



The northeastern extension directors at a meeting in August of 1958 were cognizant of this problem and also realized very well that there were several people on each of the State staffs that were working, usually on an individual basis, in trying to help solve parts of the overall problem. On a northeastern-wide basis this meant that not only was there lack of coordination of disciplines within States, but when multiplied by 12 the number of different approaches, the amount of time being spent, and the number of different bulletins covering essentially the same subject from neighboring States was quite large.

At that time the directors decided that an effort should be made to bring these various disciplines together on a northeastern basis with the central theme of doing an adequate educational job in connection with dairy housing and milk handling problems common to this part of the country.

The objective set up for this committee was to bring together and coordinate the information and techniques available in the several disciplines concerned with dairy housing and milk handling and to help all extension workers interpret them so that they could be of greatest assistance to dairymen in the Northeast.

The overall committee included representation from both dairy production and dairy manufacturing, farm management, agricultural engineering, and extension administration. This committee has worked very faithfully in attempting to bring about a truly effective inter-disciplinary cooperative approach to helping solve the dairy housing problem of the Northeast.

This has involved developing a sound procedure for the preparation of bulletins on a northeastern basis. In several cases this has meant a considerable saving from a monetary standpoint as far as all States in the region are concerned, but further the involvement of agricultural engineers, along with dairy specialists and farm management specialists, if not in the actual preparation of say a farm structures bulletin, at least in an official review capacity, has resulted.

Currently, as many of you know, Mr. Ivan Parkin, dairy specialist with the Pennsylvania Extension Service, and Ronald Furry of the Agricultural Engineering Department at Cornell University along with Irving Fellows, economist, University of Connecticut and Richard March, dairy manufacturing, Cornell, are co-authoring a milk handling bulletin suitable for use throughout the Northeast. One specialist from each State has been designated to review this material as a consultant and their names will be used in the publication indicating they have consulted for their respective State.

County agricultural agents are many times the first contact person from the university that farmers with housing and milk handling problems come in contact with. As such they should be in a position to help these men think through the alternative solutions to their housing problems as effectively as possible. Here again the Northeastern Dairy Housing and Milk Handling Committee has worked long and hard in an effort to come up with a handbook type of publication that can be used by county extension workers and State workers alike in helping people go through the economic "facts of life" that should be considered before starting to revise,



rebuild, or build new dairy housing and milk handling structures. Active assistance has been provided by all disciplines interested in the dairy farming picture and this all leads to a real sound way of assisting farmers in solving their housing and milk handling problems.

We should, of course, keep in mind that other groups and agencies are interested and have a part to play in helping to solve this problem on dairy farms in the Northeast. I refer, of course, to the dairy sanitation experts of our State Departments of Agriculture who are instrumental in setting the regulations and laws that are acceptable as far as quality milk production is concerned. The other group that we must work with is the general dairy farm and milk handling building and equipment trade. While each of the latter will have certain "gimmicks" that they will use in selling their products, hopefully the basic parts of their programs will be in line with the general thinking of all who work with farmers having this central problem.

In general, I would say that Extension has great opportunities in the whole dairy farm housing and milk handling field, opportunities that will become greater within the next few years as we see even more changes come into our milk handling on dairy farms.

If we are to take advantage of these opportunities for strong educational programs, we must be sure that we keep our work problem centered and that we do our very best to bring about close coordination and cooperation among various disciplines, not only on our own campuses but throughout the Northeast so that in the long run the farmer has the best package deal of information available to him.

This approach is one that makes for good Extension Service work. I am sure it is meaningful to farm people to have folks sit down with them who can help them think through their whole problem starting with the financial management end and progressing through to the determination of various alternatives and the final selection of the one most suitable for the case at hand.

When the Extension Service workers have a good enough understanding of each other's disciplines so that they can talk intelligently and well-informed about them and at the same time feel free to call in their counterparts from the other disciplines to give expert advice, I, for one, feel we are carrying out our duty as an extension organization in this fast-changing age of the Sixties.

Farmers live in this age every day as do we. I am convinced most of them think on a problem basis as do we. Therefore, it behooves us to work as a team of disciplines in assisting farmers to attack the problem and solve it as quickly and as well as possible.

And finally, I believe we can demonstrate that the extension services of a region can do a real job of cooperatively using their resources and by so doing bring about economies and at the same time provide the best thinking and technical assistance that is available within the region for use by any farmer whether he lives at the tip of Maine or the western border of Pennsylvania. This in itself helps show people that we mean what we say about interstate inter-disciplinary education as a part of sound Extension Service work in the years ahead.



## REPORT OF DAIRY HOUSING COMMITTEE

L. M. Vaughan, Farm Management  
Federal Extension Service  
United States Department of Agriculture

Director Davison has reported on the purpose for a regional interdisciplinary committee, and what the northeast directors expected from such a committee. This is a brief report on what the committee has done.

The first job of the committee was to establish a specific set of objectives in line with the general purpose and intent, as expressed by the directors. These objectives were stated in the form of directions in which it seemed desirable to move:

- (1) To bring about a closer agreement on what Extension is telling dairymen about dairy housing.
- (2) To encourage cooperation among States, disciplines, and commercial interests in conducting educational programs on dairy housing.
- (3) To improve Extension's approach to working with an individual dairyman on his housing problems.

All activities were tested in light of their contribution to these three objectives.

At the committee meeting in New York City, January 1960, it was decided to send to each State two bulletins that had been recently published in Pennsylvania, one on stall barns and one on loose housing. The committee had three reasons for taking this action:

- (1) Pennsylvania planned to revise these bulletins and had expressed a willingness to cooperate in preparing them for regional use. One purpose, therefore, was to get suggestions for Pennsylvania to consider in making their revisions.
- (2) A second purpose was to use these two publications as a means of finding out how much difference there was in the thinking of individuals and States on the subject matter presented -- due to different farming conditions, sanitary regulations, research findings, and personal opinion.
- (3) A third purpose was to bring together in each State the various specialists concerned. It was suggested that the publications be circulated to dairy, engineering, and farm management, and that a report be submitted that combined the comments of this group.

This effort of the committee resulted in some worth-while group discussions by specialists in a number of the States. It assembled some excellent suggestions for use by the Pennsylvania authors, which were carefully reviewed at a later meeting of the committee.



An important by-product of this inquiry was the stimulation that it gave the committee, when they realized how important strong personal feelings were in accounting for some of the differences in opinion.

As usual, in a regional assignment of this kind, extending over several years, a number of publications become available that were not in the picture when the project was started. At the committee meeting at Pennsylvania State University in May 1961, a review was made of all the recent and forth-coming material in order to reconsider the need for any regional publications for the Northeast. It was the feeling of the committee from this analysis that there was still a place for a series of basic publications that put primary emphasis on helping dairymen evaluate alternatives.

It was further agreed that these publications should be designed for regional use; that they should draw on a broad base of knowledge and experience through contacts by the authors with consultants from the various disciplines in other States; that they should recognize differences in producing areas, if any; and that they should avoid restricting the use of a publication by unnecessary reference to State and local conditions.

The regional series proposed by the committee was as follows:

- (1) Farmstead Engineering for Dairy Farms - a publication on "systems planning," patterned after the present Massachusetts publication on Farmstead Engineering. (Leadership to be taken by Robert Kleis and Joe Clayton, Massachusetts.)
- (2) Stall Barns for Dairy Cows - a revision of the present Pennsylvania publication. (Leadership to be taken by Roger Grout, Pennsylvania.)
- (3) Loose Housing for Dairy Cows - a revision of the present Pennsylvania publication. (Leadership to be taken by Roger Grout, Pennsylvania.)
- (4) Milk Handling Systems - a new publication on an exploration of alternative milking systems. (Leadership to be taken by Ivan Parkin, Pennsylvania and Ronald Furry, New York.)
- (5) Economic Considerations Related to Dairy Housing Problems - an in-service type of publication for county agents and State specialists on some of the economic considerations involved in making capital investments. (Leadership to be taken by George Ecker, Connecticut, and L. M. Vaughan, USDA.)

A mimeographed draft on Economic Considerations has been prepared for distribution at this meeting. An earlier draft was reviewed by the Northeast Farm Management Extension Committee, and by members of that committee with their dairy and engineering co-workers in each State.

The publications on Stall Barns, and Loose Housing have been submitted to all States for comments. Final drafts for publication are now being prepared.



A preliminary draft of the publication on Milk Handling Systems has been reviewed by the housing committee, and a draft is now being developed by a regional group of consultants representing all States and disciplines. This regional group of consultants met just prior to this conference to clear up some of the controversial points. Four persons were named to jointly author the publication -- Ivan Parkin, Dairy Science, Pennsylvania; Ronald Furry, Agricultural Engineering, New York; Richard March, Dairy and Food Science, New York; Irving Fellows, Agricultural Economics, Connecticut.

Further work on a revision of Farmstead Engineering is anticipated in the near future.

There are several concepts as to what constitutes a regional publication:

- (1) It may be a publication prepared by a special group representing all States concerned. A recent example would be "Hay Conditioners in the Northeastern United States," published in West Virginia. This is the procedure being followed in connection with the proposed milk handling publication.
- (2) It may be a publication written by one or more authors, submitted to the States for suggestions, and so handled as to make it generally usable in a number of States. This is the procedure being followed in connection with the proposed stall barn and loose housing publications. It is the procedure adopted by the Northeast Farm Management Extension Committee for their regionally sponsored publications.
- (3) It may be a publication of strictly State origin which becomes of regional value simply by the way the author treats the subject. For example, if an author lists the questions farmers are raising, and then proceeds to document his comments with the findings of research and the experience of farmers throughout a region, he has automatically prepared a publication of value to any farmer faced with the problem regardless of his location.

There is obviously a place for each of these approaches, but usually we think of regional publications as being prepared by some special group under some kind of an organized plan. However, the committee wanted to call attention specifically to the potential that lies in making greater regional use of State publications on problems that are common to a number of States. If the wider application and use of such publications could be recognized by the author, and arrangements made through editorial channels to inform other States of their preparation, purchase orders could be placed and included in the original printing. This would greatly speed up availability. For example, timeliness is an important factor on a subject like the one covered in a recent New York publication on "Milking Parlors with Stanchion Barns -- An Economic Appraisal," A.E. Res. 82. This is but one illustration. There are many others.



The final activity of the Northeast Dairy Housing and Milk Handling Committee has been the development of the plans and program for this workshop. Director Davison has fully covered the purpose for this meeting, and the reasons why we are here.

With the completion of publications already under way and the preparation of a proceedings report on this workshop, the committee feels that its objectives will have been met. A coordinated application of our respective disciplines to the problems of farm people is not something that can ever be completed by committee action, or otherwise for that matter. It is a continuing process. From time to time a committee can re-emphasize its importance, re-establish some activities, and re-interest people in its possibilities. That is what we as a committee have tried to do.

The committee does feel, however, that without some formal arrangement by extension administration to encourage interstate cooperation and provide some form of clearance for publications of a regional nature on a continuing basis, much of the committee's effort will be lost and very little progress made along similar lines concerning other problem and subject-matter areas.

HOW DO WE STRENGTHEN EXTENSION'S EDUCATIONAL  
LEADERSHIP IN A NORTHEAST DAIRY HOUSING PROGRAM?  
(Summary of Comments by Discussion Groups)

Milton E. Hislop  
Associate State Leader of County Agents  
Agricultural Extension Service  
Cornell University

Four discussion groups were formed to consider the broad general question of "how to strengthen Extension's educational leadership." Each group was given six specific questions on which to record their thinking and be prepared to report back to the conference. A digest of the comments has been made for each question considered.

Question I. - How do we establish and apply the  
inter-disciplinary approach?

The approach must be adopted on a State by State basis:

- (1) Administration must indicate that the individuals in different disciplines are expected to cooperate fully. The approach should be carried as a policy throughout the entire State extension organization.
- (2) Administration must provide a framework or environment which will encourage and permit disciplines to work cooperatively in planning, execution, and evaluation of a program or publication.



- (3) Each discipline concerned must be involved in the earliest possible phase. One individual should not do all the planning and then ask others to participate in preparation.
- (4) The work of planning should be reviewed at appropriate stages and the recommendations of work group or committee should be approved, revised or rejected. Work should not be concluded before review, which might lead to rejection and result in much time and effort wasted.
- (5) Administration must give serious consideration to recommendations for joint action, and upon approval of plans provide the necessary resources and the administrative support required.
- (6) Administration and disciplines should work to create attitudes favorable to this type of approach.

Some problems as they might be viewed by a specialist:

- (1) Specialist may feel that approach is extremely time consuming, because of necessary group discussions -- particularly on publications.
- (2) Specialist may feel the procedure will restrict his freedom of action.
- (3) Concern may be expressed that an individual's program is threatened since the particular discipline is combined with others and focused on a problem rather than a subject-matter area.
- (4) Individual may fear he will lose his identity and importance.
- (5) The inter-disciplinary approach requires more advanced planning on the part of individuals concerned. Therefore, self-discipline by the individual is increased.

Question II. - What are the opportunities for inter-state cooperation -- personnel program and funds?

Several alternatives were proposed for consideration:

- (1) Possibility of regional specialists on the staff of Federal Extension Service to coordinate the efforts of State specialists on programs of common interest to all States. This would be especially important in connection with new innovations.
- (2) Possibility of trading specialists between States. This would give States with insufficient funds to hire a large enough staff an opportunity to have the benefit of information collected by a person who specializes within his respective discipline, for example, an engineer devoting full time to housing.



- (3) One alternative is to utilize one man instead of a team, and develop him, for example as a dairy housing specialist, with subject-matter training in three or more primary areas rather than solely in one subject-matter field.
- (4) As an interim arrangement, cooperation between and among States in the region to pool manpower and funds could be undertaken to help solve short-term problems. In the Northeast there is an arrangement for exchange of specialists. Possibly it is not used to the fullest extent.
- (5) Extension administration must be encouraged to consider and advance the advantages to our educational programs that inter-disciplinary regional cooperation provides.

Question III. - Can regional publications help? If so, how do we get them developed, accepted, and effectively used?

Regional publications can help because:

- (1) Many of the housing problems are ones that the Northeast States have in common.
- (2) Economies can be realized in preparation and printing of publications.
- (3) More complete agreement can be reached among disciplines and States concerning the housing subject.
- (4) A northeast publication would provide a united front to present to regulatory officials and industry personnel.

Some limitations would include:

- (1) Problem of weakening or watering down -- beware of this.
- (2) Time element - takes longer to get done.

There is need for northeast directors to develop a policy for regional publications -- how to get a publication out and how to distribute it.

Reinstate system whereby specialists would be informed about anticipated publications -- be able to order if desired.

Get needs to State directors who could then have them considered at northeast directors' meetings.

Method of development would include:

- (1) Committee system of specialists to outline and write bulletin.
- (2) System of reviewing publications between States.



Steps in the procedure would include:

- (1) The use or uses of the publication should be defined.
- (2) An outline should be prepared by representatives with all disciplines and all States represented.
- (3) Two or more authors from different disciplines and different States should prepare the publication.
- (4) The first draft should be sent to the representatives who participated in the preparation of the outline. These representatives should review the manuscript, asking for comments from their associates (including other disciplines) and send all suggestions to the authors.
- (5) The authors should modify the manuscript to comply with the consensus of suggestions, where possible.
- (6) This revised manuscript should be reviewed at a meeting of the representatives who prepared the original outline.
- (7) The States should be notified of the expected publication date so they can plan accordingly for the publication's usage.

A publication should be adequate if prepared by the above methods, and therefore would, no doubt, be accepted, and effectively used by the States involved.

Question IV. - How can Extension improve its competency in dairy cattle housing?

The following suggestions are considered to be important:

- (1) Keep up-to-date on information which may be applicable not only to present housing, but to possible housing for the future.
  - a. A considerable amount of information must come from a study of existing methods and techniques, backed up with facts and figures. This is of necessity a continuing process.
  - b. The progressive extension person will initiate a certain amount of extension, or practical research of his own, as occasion permits.
  - c. If lack of information in certain areas indicates the need for further professional research, sell the idea to your Experiment Station personnel.



- d. There is a need for an exchange of ideas and information between States, through the Northeast Plan Exchange Service, through regional or area conferences, workshops, farm tours, and through the preparation of regional publications.
  - e. A comprehensive knowledge of subject-matter material is essential to improve competency.
- (2) Adopt a policy of inter-disciplinary cooperation in the presentation and evaluation of information.
- a. Inter-disciplinary consideration of a problem and possible solutions to the problem can't help but increase the competency of all involved.
  - b. Inter-disciplinary consideration and cooperation offers a better possibility for a realistic appraisal and solution of a particular problem or problems.
  - c. Such a policy should result in better harmony and agreement between those disciplines involved.
- (3) Formulate a plan for presenting the information so it will be understood and appreciated.
- a. Present facts, not opinions.
  - b. Present both disadvantages and advantages in a fair manner.
  - c. Present alternatives in a manner that will help, rather than confuse the dairyman.
  - d. The methods of presenting information may vary, but might include farm tours, meetings, demonstrations, construction plans, bulletins, and last, but not least, through personal interview. Remember that changes in dairy housing usually involve large sums of money and usually occur only once in a lifetime.

Some additional specific recommendations would include:

- (1) Guidelines and standards of performance developed for specialist use.
- (2) A policy of extension administration, which would permit specialists to serve as paid consultants at least one day a week would contribute immeasurably to the competency of specialists in their respective fields.
- (3) Opportunity for extension specialists to do more field investigation and research to increase their competency.



- (4) Opportunity for specialists to travel to other States for short periods to observe specific relative problem areas, other than would be involved in a sabbatical leave program.
- (5) Opportunity for specialists to take a sabbatical leave to serve in another State as a visiting specialist.
- (6) Regional workshops for specialists to exchange experience.
- (7) Encourage move toward area or regional agents with specialized competency.
- (8) Make sure agents are given in-service training in area of dairy housing, with emphasis on the inter-disciplinary nature of this work.

Question V. - How can we evaluate, contribute to and use individual innovations in our educational program?

Become program oriented. Develop a dairy housing program in each State. Appoint a committee of dairy, engineering, and management specialists, activated to develop a program which includes present methods and systems to be recommended. This committee to be on alert for new innovations and be responsible for an evaluation of such a program.

An administrative committee of northeast administrators be set up as a clearing house for new innovations as determined by State program committees.

The functions of such committees or special subcommittees would be:

- (1) Make a field review of new innovations, using a research approach. This might include visits to a few farms in several States to collect data necessary in a complete evaluation. This method would precede a larger research project that may be held back because of a lack of enough farms or enough funds.
- (2) Pull together their observations, using a systematic approach, and send to the housing program committees of the various States for further review and suggestions for future recommendations by extension workers. A progress report of these observations and evaluations would be printed for use by northeast specialists.

Extension can't do controlled research. However, we can and should use a team approach to completely survey and evaluate the innovations dairymen develop, so that the idea can be properly portrayed to other dairymen. At the same time, every effort should be made to coordinate research and extension efforts and encourage future research in the field.



Question VI. - How do we encourage and develop commercial and regulatory interests?

The following four points present a general consensus of opinion:

- (1) Make known to commercial interests and regulatory agencies that a regional inter-disciplinary group is active in considering and recommending general and specific practices for dairy housing in the Northeast and that the purpose of this regional endeavor is to resolve differences both within the States themselves and between the States so that a common or standard approach to Northeast housing problems might be expected -----.

... There is a definite need for those charged with the administration of this project to establish and maintain close liaison with commercial and regulatory groups once we have our own house in order.

- (2) Create an atmosphere of cooperation in recognizing and appreciating the positions and attitudes of commercial interests and regulatory agencies.

If we, as a group, are following the "problem approach" then these interests might very well be thought of in a category similar to that of the dairymen.

- (3) Actually solicit the assistance of these groups in recognizing and solving practical field problems.
- (4) Maintain regular liaison with commercial and regulatory groups at local, State and regional levels;
  - a. Individual interests or agencies,
  - b. Groups representing these agencies.

Some further specific suggestions would include:

- (1) Workshops designed to discuss latest innovations with industry personnel. Joint recommendations by extension specialists and industry personnel could be the result of such an effort.
- (2) Standing committee of university and industry personnel to meet regularly as a means of anticipating ideas and problems that may occur, before expressing wrong ideas to farmers.
- (3) Solicit commercial help for educational demonstrations.
- (4) Conduct training schools for local builders. Each State has a challenge to work out better ways to do this.
- (5) Recommend that northeast directors consider a regional meeting of major commercial companies. This might be an every-other-year event.



## EXTENSION'S OPPORTUNITIES

C. R. Harrington  
State Leader of County Agents  
Agricultural Extension Service  
Cornell University

The objective of this workshop was stated well in the assignment to Director Davison: Strengthening Extension's Role in Dairy Housing Problems Through Inter-Disciplinary Cooperation. You are authorities in the field of dairy housing and I don't intend to summarize your discussions in this area. I do want to discuss Extension's Role and Inter-disciplinary Cooperation in terms of opportunities.

Extension's future opportunities depend upon two basic requirements:

- (1) Understanding Extension's contemporary mission in society and interpreting it to others.
- (2) Modernizing and adjusting Extension resources and focus to accomplish the greatest service to individuals and society, in light of modern agriculture, communication, transportation and competency of people employed in agriculture.

The Land Grant-Extension system came into being because of society's interest in:

- (1) Improving the standard of living and the opportunities for farm and rural people.
- (2) Assuring a growing society of an adequate supply of food.
- (3) Releasing resources from agriculture to produce other goods and services demanded by a developing society.

Thus, Extension has had a mission that was in the best interests of the individual and of society. To accomplish this mission required that Extension contribute to the development of a commercial agriculture. The extent of commercialization and specialization today is testimony to the results of these efforts.

What, then, is the modern version of the mission of the Land Grant-Extension system?

First, let's look at it from the viewpoint of society. With American society depending upon less than 10 percent of its people to produce its food needs, it should be interested, consciously or unconsciously, in those elements that contribute to an assurance of an adequate food supply. Of primary importance would be an agricultural industry that constantly approaches a state of adjustment to new developments. This state of adjustment requires capable management supported by adequate knowledge.



In addition, of course, is a requirement for a public policy climate that permits this management to adjust.

Now let's move to the individual -- what are his interests or problems? His major problem as a manager of an agricultural enterprise appears to be one of responding adequately to major new developments -- technological, economic and social. More than ever before, the premium is on management decisions and ability.

Thus, the modern mission of Extension would appear to be: A commercial agriculture that is continually in a state of near-adjustment to new developments and changes in order that society may be assured of an adequate supply of food and that the individual and his family may be assured of a standard of living comparable to others.

So much for mission, but I contend that emphasizing management or adjustment results in some change of focus of Extension efforts.

Now let's move to modernizing and adjusting resources. There may be many facets to this and each State is different. I want to concentrate on one aspect only -- programming.

During the past 30 years, Extension programming has evolved from the community to the county level. Some attempts have been made on the regional basis within a State. The next logical step appears to be institution-wide programming within a State. After we perfect this, then we may be able to move to regional within the country.

What is institution-wide programming? What does it involve?

First it means a decision that Extension as an institution is going to concentrate on certain problem areas. This will require better intelligence about people and where they are than we now have.

Secondly, it means a new kind of organization within Extension -- across departments and disciplines -- to tackle each of these problem areas.

Thirdly, it means a recognition of the basic contributions of each of the major segments of Extension:

State Staff -- mobilizing the knowledge and resources.

County Staff -- mobilizing the participation of people.

Let me make it clear that I am not talking about "top-down" programming. Neither am I talking about "grass roots." It is a combination of the two -- institution-wide.

Secondly, let me point out that this kind of programming does require strong leadership, probably at the State staff level.



One of the consequences of such a movement is that State staff people will need to develop a greater understanding and competence in designing a total program. They can no longer be content with sitting back and criticizing county staff for a poor job of program development.

Let me see if I can illustrate this by using Dairy Housing and Milk Handling as an example. (See diagram on next page.)

Three consequences of this approach on concept:

- (1) Individuals and disciplines lose some of their identity.
- (2) Program design provides much discipline.
- (3) Extension can and will have a greater impact.

The Extension Service has been and is a unique kind of public educational institution:

- (1) Its major strengths are its base in a university and its field arm or office in nearly every county. No other adult education agency has as much.
- (2) Its educational efforts have been tied closely to the results of research.
- (3) Its close ties with people have kept its education practical.
- (4) It has had a mission beyond the mere dissemination of knowledge; it has a mission of improving the lot of individuals, families and society.

Extension's future is assured if we have the courage to live up to our belief that we are dynamic and flexible.

I am impressed by the genius of Admiral Rickover -- the father of the nuclear submarine. He had two groups of engineers working under him; one responsible for designing and building the basic sub; the other, the nuclear power plant.

He made both groups live and work together. The one group protested, saying let us design the sub and then they can install the power plant. The other protested, let us design the power plant and then they can build the sub around it.

But he forced them daily to face each other. Each group was disciplined by the other and working together they broke through to their goal.

Perhaps Extension's Opportunities will be best realized if we apply some of the same reasoning and discipline.

AREA OF CONCERN: Dairy Housing and Milk Handling

GENERAL OBJECTIVE: To Reduce Costs of Producing Quality Milk

**GENERAL OBJECTIVE:** To Reduce Costs of Producing Quality Milk

# FLOW CHART

[illegible]





## EFFICIENT UTILIZATION OF EDUCATIONAL RESOURCES

In this section of the report, you will find papers on the role of specialists in program development, the approach of a county agent in working with farmers, and the function of a State leader in fully utilizing Extension's educational resources in a coordinated total effort.

### SOME ECONOMIC CONSIDERATIONS RELATED TO DAIRY HOUSING PROBLEMS

George A. Ecker, Farm Management  
Agricultural Extension Service  
University of Connecticut

NOTE: This is a digest of the comments made by Mr. Ecker. A more complete statement is available in a Northeast regional mimeo by the same title available from the Department of Agricultural Economics, University of Connecticut.

A recent article in one of the popular agricultural magazines related the plight of the dairyman who was intent on expansion of his dairy unit to 100 cow capacity. As a consequence he borrowed the necessary money to build the set-up for 100 cows. When it was completed he had exhausted his credit and began with 12 cows to start to pay off his investment.

Perhaps this is an extreme situation and not typical. However, it does illustrate the point that one should consider all angles of the problem before proceeding to make a specific adjustment or change.

To do an effective job of planning profitable changes, it is necessary to consider the farm business as a complete unit and recognize the impact a particular adjustment will have upon all phases of the farm. It is the manager's or operator's responsibility to make decisions which usually require the procurement of information from various sources, the Extension Service, commercial firms, public agencies, etc.

A farmer is concerned with all information pertinent to his problem, but unfortunately, it is the exception rather than the rule, to have a single person so well informed that all the farmer's questions can be answered. Consequently, this may result in gaps of information or the complete omission of factors pertinent to the over-all solution. In addition, it is often impossible for all the specialists concerned with a particular type of problem such as dairy housing, to work cooperatively on each individual's problems.



Therefore, if an attempt is to be made to improve the coordination of information related to a type of problem it seems desirable that the various specialist involved have some understanding of the overall pertinent considerations to the problem. That is not to say an economist should become an engineer or dairy specialist, or vice versa. If a specialist is at least able to recognize obvious gaps in the farmer's planning process, he might be able to obtain the necessary information or encourage the farmer to investigate his problem more thoroughly.

The basic purpose of my discussion this afternoon is to explore considerations related to making capital investments, applied specifically to dairy housing and to review some alternative housing arrangements and milking systems as they may contribute to dairy farm adjustments.

Due to the scope of housing problems faced by dairymen, it is virtually impossible in the discussion, to cover specific solutions to a given situation.

#### Deciding On The Future Of The Farm Business

Dairymen of the Northeast, like other farmers throughout the United States, are continually faced with a "cost-price squeeze," -- evidenced in the past decade by relative stability of milk prices and the rising costs for land, labor, machinery, buildings, cows, feed, and other resources used in milk production. This has resulted in a continual narrowing of the margin between production costs and product prices.

In the face of the reduced margins, dairymen have been forced to either accept a lower standard of living or attempt to maintain net income by increasing production per cow, more efficient use of labor and capital, and increased volume of business. Those producers who took immediate steps to counter the cost-price trend have been able to make adjustments in their operations sufficient to maintain satisfactory net incomes. At the same time, other dairymen have ceased farming or reduced their operations and supplemented income from off-farm sources.

Many dairymen still find themselves at the crossroads as to what should be done to put their business on a solid economic basis. It is a matter of selecting from three choices, (1) whether to make the investment necessary to stay in for the long haul, (2) whether to do only what is necessary to cover current cash operating costs, or (3) whether to quit farming now.

Under Northeast conditions, any one of these alternatives may be the appropriate solution, depending on the general area situation, the individual farm and the specific family conditions.



A decision on which of these courses will be taken is basic. It will determine the adjustments necessary, and influence the kind of housing improvements desirable, for any given farm situation.

The remainder of my discussion will be focused on an exploration of situations faced by dairymen who plan to stay in business. Actually, the conomic considerations to be discussed pertain to any type of capital investment, but are illustrated as they pertain to dairy housing.

### Maintaining A Proper Balance

The resources used in dairying--land, labor, livestock, equipment, and buildings, must be combined in the proper proportions to result in a profitable business. Once this balance is upset by a major building change, a chain reaction is set off which can and often does affect other segments of the business. These subsidiary effects of a major housing adjustment must be considered when analyzing its impact on the business.

For example, assume that a stall barn fully automated with a barn cleaner, silo unloader auger feeding system, bulk feed would permit a 40 cow herd with 2 full-time men to be expanded to 70 milking cows. In addition to consideration of the building changes and expansion of cow numbers, the necessity to obtain more forage should not be overlooked. A shift to a heavy silage program may involve raising more corn which in turn requires additional silo capacity. New and larger silage harvesting equipment may be necessary, including a more powerful tractor.

From this, one can visualize that a major change in buildings does have a profound impact upon various segments of the farm business. Each side effect must be carefully analyzed on the basis of the additional costs involved and the added returns expected.

Each dairyman has to decide what adjustments are needed most to improve the profitability of his business. The starting point is often that of recognizing unused resources and other "out of balance" conditions that can be corrected with relatively little additional capital investment.

### Making Adjustments Involving Capital Investments

One of the main considerations for the dairyman who plans to remain in business is for how long. A dairyman who looks forward to another 10 years until his retirement, may follow an entirely different path to solve his situation compared to the fellow who plans on another 20 or 30 years.



The fellow whose farm location is on the fringe of an urban area must consider his adjustments in a different light than one located in a more stable farming area. His farm with a possible limited period of agricultural use will undoubtedly pass to a use which does not require farm buildings. The individual in this situation must plan to recover the cost of any capital improvement within the time he anticipates to stay in business.

This is a real problem for some and frequently due consideration of the potential situation is not given when planning housing adjustments. However, one should not conclude that all housing adjustments would be economically unsound. There are possible improvements to gain efficiency on which the capital investment can be repaid within 5 - 10 years. Silo unloaders, transfer milking systems, are but 2 examples which one could expect to pay off in a relatively short period of time.

Also, many improvements permit a man to stay in business even though they may not add to profits.

#### Types of Costs Involved

Two types of costs are involved for all capital investments--buildings, livestock and equipment. These are overhead or fixed costs and operating costs. Overhead costs are those which must be pro-rated over the expected life use of the investment, while operating costs are those expenses incurred for resources which are used within a short time period, such as one year. The annual ownership cost of a tractor is an example of overhead cost, while the fuel used to run the tractor is an operating cost.

The overhead costs of a capital investment consist of depreciation, interest, repairs, taxes, and insurance.

Therefore, if a capital investment is made in remodeling a dairy unit, or purchasing new equipment, the additional annual cost of the investment must be paid either by increasing gross income, reducing present operating costs, or a combination of the two. If either of these is not done singularly or in combination, the additional cost will result in a reduced net farm income.

Occasionally statements are made indicating that if \$2,000 per year in labor costs can be saved by a new set of buildings, it is possible to invest \$20,000 to be repaid over a 10 year period. While it may be true that an annual saving will repay the initial investment, one should not overlook the other costs incurred. Interest at 6% per annum would be \$6,600 in 10 years if \$2,000 is repaid on the loan with interest charged on the remaining balance. Other costs incurred are repairs, taxes and insurance.



The rate of loan repayment is often at a more rapid rate than the depreciation allowance. This is often true of building investments where loan repayments are on a shorter time basis than the extended life expectancy for depreciation purposes.

An appraisal of alternatives should not be made exclusively on a comparison of investment costs. A higher first cost may be offset by lower annual operating costs throughout the life of the investment. The important question to answer is "What effect will the investment have on net farm income?"

#### Expansion Through Annual Earnings or Borrowing

A key economic question of many dairymen is whether to make an adjustment gradually out of earnings, or all at one time from borrowed money. If an adjustment is profitable, there is a definite advantage in making the change in one "big" step although borrowed capital will be necessary. However, the possibility of doing this may depend on the individual's present financial position and his ability to meet the loan repayment schedule required by the lender.

#### Appraising Alternative Housing Arrangements

On some farms increased efficiency is possible through modernization within existing buildings, and economic gains can be made without a substantial increase in the size of herd. Other farms, in order to make adjustments, will require more cows and the increased herd will involve additional building space. This raises a question of what to do with existing facilities. Should they be used in the expansion or is it preferable to start anew?

Such questions involve both the type of housing and the best system of housing.

The most profitable adjustment for a given situation may be determined by budgeting. This is a paper and pencil procedure which takes into account how an adjustment or series of changes will affect net farm income through its impact upon costs and receipts.

It may be helpful to mention the more common courses taken by farmers under different situations.

Extension of Present Stall Barn -- This is the most common solution for many farmers who have a modern barn in relatively good condition, or one that can be satisfactorily modernized.



A Loose Housing Set-up for Milking Herd with Present Barn Used for Dry Cows and Young Stock -- This solution is the answer for some dairymen who have an inconvenient, poorly arranged stable, expensive to modernize but adequate for other uses.

Conversion of Present Livestock Buildings to a Loose Housing System for Dairy -- This solution is a logical step for farmers who are shifting from beef cattle feeding to dairy. The existing nucleus of feeding areas and loafing sheds forms a start on a new system for the dairy herd. Attempts by some farmers already in dairying to use a part of their present stall barns for loafing sheds or feeding areas have met with only partial success.

A Modern Stall Barn Replacement -- A new all-purpose stall barn is the decision made by many farmers who must completely replace present facilities and who prefer to keep cows in stanchions. Various forms of mechanization and automation are now available to incorporate into new construction.

A Complete New Loose Housing System -- This solution seems to meet well the needs of dairymen close to market who are developing large herds. The need is for savings in labor and low investment per cow, with storage requirements at a minimum.

### Appraising Alternative Milking Systems

The adoption of bulk milk handling has resulted in many alternative ways of handling milk. Today it is a matter of how much can one afford to invest. Some of the points that should be considered before making a decision are:

1. Can effective use of the new system reduce labor requirements for the herd or can more cows be milked with present labor force?
2. How many other changes in the barn, milk house, wiring, or number of cows will be required to take full advantage of the new equipment?
3. Is the capital available, your own or borrowed, to make the investment? Is this the best alternative use for the money? Would some other alternative return more to the business?

### Summary

Any major building adjustment program must be looked at from the standpoint of the factors listed below:

Cow health, sanitation, milk production, feeding, etc.  
Amount of labor required, ease of working, etc.  
Capital to be invested, operating costs, etc.  
Credit arrangement, effect on farm income, future expansion, etc.  
Soundness, durability, and practicality of the structure or type of equipment for the purpose.



With relatively few sources where the data, from the disciplines of dairy, engineering and economics, has been related to a specific problem, it makes it very difficult for dairymen to coordinate and apply information from many sources. It is hoped those people working with farmers on dairy housing problems will have a better understanding of this situation, and the need for relating information. As a result, they should be able to help farmers do a better job of considering alternatives before reaching a decision on the over-all plan.

#### ENGINEERING ASPECTS OF DAIRY HOUSING

J. T. Clayton  
Professor of Agricultural Engineering  
University of Massachusetts

The full contribution of dairy farmstead facilities to efficient production can be realized only when the "building facility" - which is composed of myriad pieces - is well planned, well arranged and lends itself to the use of associated mechanical and electrical equipment and acceptable management practices.

Significant progress has been made in the development of buildings, equipment and management practices to increase the effectiveness of dairy farmstead operations, but the rate of concrete change on farms has been relatively slow. This slowness has been variously attributed to the existence of a physical facility representing a high investment, the natural resistance to change, and compelling sanitary regulations. But perhaps, most of all, it is due to a confused idea of just what can be done and what might be the result in specific cases. The integration of buildings, equipment and production methods remains a hazy area for farmers and many of those in position to advise them. This is especially true where groups of buildings are required--where the effects of internal and external arrangement must be combined with an assembly of diverse methods and equipment.

Farmstead planning is confused by the fact that equipment, to say nothing of the structures with which it is used, is made and sold by many manufacturers and dealers. The complete package is still something to be worked out on an individual basis. It is often attempted by people not well grounded in the over-all picture. The frequent result is that it involves many unnecessary compromises.



In many cases the use of mechanical equipment to overcome poor layout has been emphasized. In situations where layout is already determined and relatively fixed, this may be the proper solution, but it is erroneous to assume that more and better equipment is always the whole answer. Even the work of an efficient machine can be supplemented by good arrangement. Good arrangement has no operating cost and will almost always reduce the cost of installing and operating the essential equipment.

It must be constantly borne in mind that flexibility of the entire system is of utmost importance because of rapidly changing technology. A good solution last year may not be a good solution now and very likely will not be the best solution next year. It must be possible to modify the facility to keep pace with changing production requirements and farming methods.

Too often farmstead organization is considered to be an essentially static thing. It is true, in most cases, that changes come relatively slowly; however, if one follows the transition of any farmstead over a period of a few years, it will likely be found that rather great number of changes have taken place. The fault is that these changes have occurred one at a time because of particularly disagreeable situations, with little thought of an ultimate goal.

The common practice of basing farmstead improvements on the accomplishment of isolated objectives places too little emphasis on the development of a facility with better over-all organization. What is needed is a thoroughly worked out plan for providing the right buildings, located in the right places, with the necessary lots and areas, and the whole layout provided with a "system" of equipment for handling the jobs in a logical order from beginning to end with a minimum of supervision.

In order to be effectively done, dairy farmstead organization must be viewed in ways more critical than have ordinarily been used. One of the engineer's greatest obligations is to relate buildings and equipment to best current production practices in such a way that the likelihood of gross misuse is small.

Standardization in manufactured and packaged systems (thus limiting choices) might eventually lead to easier choices in farmstead design. It is difficult to believe, however, that farmstead solutions will become standardized in the near future. As a rule, the integration of buildings and equipment, with its many alternatives, will remain a problem to be worked out on an individual basis, since no one manufacturer or supplier makes or sells all that is needed.

Recently, some favorable steps have been taken to integrate buildings and equipment into working units at the manufacturer's level. A few building manufacturers are working closely with producers of farmstead equipment to provide a "systems engineered" farmstead facility. This



important trend will surely grow and should tend to somewhat simplify the planning required to meet the needs of the ultimate user's peculiar situation.

Even this progressive step leaves the external arrangement of buildings and lots to the judgment of the farmstead planner. A further step by manufacturers to show details of how their products fit into a whole operational picture would lead to better organization.

In any case, a set of clear cut objectives and a carefully made plan to meet the total need can lead to good dairy farmstead organization whether the objectives are met in one bold sweep or in stages over a period of time.

## DAIRY TECHNOLOGY RELATED TO DAIRY HOUSING

Joe S. Taylor  
Professor, Dairy Science Extension  
Pennsylvania State University

### General Situation

As educators who have been assigned the task of furnishing farmers with the best information possible on dairy housing, so that they can make wise decisions, on a construction job they hope to do only once in a life-time, we should ask ourselves some soul searching questions:

1. Which is more important, an analysis of the economic, engineering, aesthetic and quality considerations as related to dairy housing; or an analysis of the dairyman as to his determination and ability to manage and revolve the added capital investments required for proper dairy housing? i.e., how far does he want to go?
2. What effect will the new dairy housing have upon his market stability?
3. Can he properly finance what we recommend; are his cows and management ability good enough to pay for the structure?
4. Will we become a part of putting a dairyman out of business, or improving his competitive position and level of living?

A blanket answer for any of these questions cannot be given that will fit all dairymen, nor will we have the opportunity as educators to help too many dairymen individually with their total decision making



process. In too many cases the dairyman has already decided what he wants to do, so all he asks of us is what kind and size of structure he should build -- and this is not our job.

Therefore, it is our duty to develop an overall educational program embracing all disciplines and present it in such a way that we encourage dairymen to consider all of the problems involved in new or remodeled dairy housing. If my analysis of the situation is correct, we do not have a coordinated dairy housing program in most states. We usually have an economic, engineering and dairy set of recommendations, each oriented to fit the individual discipline's specialized thinking on dairy housing. Very few states have pulled all of the disciplines together into a coordinated dairy housing educational program. Perhaps, this is the reason so many commercial organizations have developed complete farmstead planning and structural services.

We now have a decision to make. Do we offer a coordinated educational program for the dairymen before the commercial organization takes over his planning program, or do we attempt to educate the commercial planners, or do we stand by as critics of what the commercial organizations build for dairymen? We may accept the critic's position as it is much easier to be critical than to be constructive, especially so when being totally constructive involves coordinating so many specialized individuals in our various college disciplines.

We must recognize that the human desire for herd size expansion, which may or may not result in an ever increasing level of living, continually causes the farmer to consider expansions as the solution to all of his problems. He usually does not make an analysis of the economic, marketing, engineering and total management considerations involved in a new housing program. He just wants to expand. Therefore, a team approach on all of our educational work in dairy housing is essential, if we hope to help dairymen make sound decisions.

### The Revolution in Dairy Housing

The revolution in dairy housing, herd size expansion and quality milk production as affected by housing may have received a decided impetus from new dairy technologies. However, it cannot be truly said that technological developments created the need for these changes.

Rather, I am inclined toward the opinion that economics, plus the desire of dairymen for an ever higher level of living has created the need and that the technologies which made possible these changes were the result of the economic trends and the individual dairyman's desire for more affluence.

As an example, the milking machine was on the market for many years before dairymen started using it to replace labor, and many dairymen gave up hand milking reluctantly. Once a dairyman adopted the use of the milking machine an ever increasing size of his dairy herd was then made possible. This usually resulted in more profit, a higher level of living and the envy of his neighbors. His neighbors soon adopted the use of this new technology, so that they could attain a higher level of living. Gradually, everyone started milking more



cows, more than they could properly house. Thus, new dairy housing requirements resulted from a combination of economic, engineering and human desire factors.

We could list many "gadgets" that we prefer to call technological developments that the dairyman didn't want, until he was assured that the technology would give him a competitive advantage resulting in more affluence or make his work load lighter. However, we must remember that most technology forces someone out of business, either because he uses it unwisely or doesn't adopt its use soon enough. This is the history of technological developments. And as everyone adopts a given technology its competitive advantage is soon lost for even those who stayed in business. Thus, the dairyman continually rides a tread-mill where too much technology, unwisely purchased or used may put him out of business and too little technology may also force him out of business. Furthermore, since technology usually costs money, it ultimately results in a larger herd size to carry the investment and this then creates the need for expanded dairy housing facilities.

#### Market Technology

There is technology beyond the farm gate we must consider when helping a farmer with dairy housing. The technology applied to milk processing, distribution and the total problem of marketing milk has been just as great as that applied on the farm.

In the final analysis, the only reason dairymen produce milk is for an existing market. Therefore, he should know what his future market potentials are before considering too much investment in dairy housing. Unfortunately, under our present marketing systems the individual dairyman can only look at market trends to assess what his future market may afford. Thus, his big consideration must be to place himself in the best competitive position with all other dairymen. Will the dairyman we help on dairy housing be able to remain competitive, or will we weaken his competitive position? How many 120 to 200 cow dairymen will our markets support? If a dairyman is efficient and satisfied with a 30 to 50 cow dairy, should we make him unhappy with a glamorous story about a big sized operation?

#### Power Technology

If we selected only one technology that has probably had the most impact on herd size expansion and the resulting need for expanded dairy housing facilities, I believe that we would have to select power, electric and gasoline. We could list transportation with all its ramifications, urbanization which created larger milk markets, a higher level of education which stimulates the desire for affluent living and many other



developments all associated with technology. However, without power none of these big developments could have happened, nor could our dairymen have moved into the area of using capital to replace labor. The use of capital to purchase technology to replace labor made possible the expansion of the family sized dairy farm which created the need for expanded dairy housing facilities.

Let us list some of the technology associated with power that has changed the dairyman's herd management procedures that created the need for expanded dairy housing. Each technology allowed the dairyman to milk a few more cows with the same amount of labor.

1. Automatic water systems
2. Milking machines
3. Pipe line milkers and milking parlors
4. Semi-automatic forage and field crop equipment
5. Semi-automatic manure handling equipment
6. Many specialized pieces of power equipment designed to do specific jobs.

#### Cow Technology

Not all dairy technology that affects dairy housing is associated with power or even engineering accomplishments. However, the science of production efficiency may have provided the means whereby more power and engineering technology could be purchased by dairymen.

Today, the dairyman knows more about genetic inheritance, more about the physiology of production and reproduction in the cow, and other sciences that affect production efficiency. He also knows more about relating the physiology and psychology of the cow to machines used in dairy farm automation.

The progressive dairyman has doubled his annual production per cow through the use of scientific technology in breeding, feeding and overall herd management. His cows are larger, work twice as hard and are more susceptible to injuries and diseases than their "loafing" ancestors, so their housing needs are different.

Medical science has provided better herd health which allows larger herds. This includes testing for contagious diseases and eliminating the infected animals, vaccines, improved drugs and improved management practices as related to herd health. The large herd operator who overlooks the disease and parasite problems inherent with large herds will soon find himself out of business.



Just consider the impact of the size of today's cows as related to dairy housing. At one time a three feet width of stall was accepted as standard. This width may have been satisfactory for the small sized, low producing cows of twenty years ago. Today, the 1500 pound cow that produces 10 times her body weight in milk each year is accepted as the standard size for 75% of our cow population (Holsteins). These cows need a four to five feet width of stall and the wise dairyman will provide several stalls even over 5 feet in width for his larger, older, usually higher producing, more valuable cows.

Loose housing for dairy cows has become the symbol of the dairy farm mechanized efficiency in the eyes of many educators and dairymen, not to mention the salesmen who make a living selling structures and equipment. Considerable data has been published on production efficiency, herd health, labor requirements and the cost of structures of loose housing as compared to the conventional stall barn. Unfortunately, most of the data is worthless because the comparisons were made with older, unmechanized stall barns where the cows were housed in "straight-jacket" type stalls and all the labor was preformed by hand.

We now know that the stall barn can be mechanized for labor efficiency, constructed for cow comfort and production efficiency. However, the dairyman must squat to attach the milking machines to the cows and he is limited more on herd size expansion.

We now know that a properly arranged and constructed loose housing system costs about as much per cow as a good stall barn. We also know that it takes a better dairyman to properly manage a loose housing system. If he is not very careful, he loses in less attention to his individual cow's needs on feeding and management far more than he gains in labor efficiency through the extra automation provided in loose housing systems.

Unfortunately, many dairymen who continually had problems with their sanitary inspectors looked at loose housing as a solution to their problem. Others went half-way on loose housing structures which resulted in unmanageable and unsightly results. Either one or a combination of these two situations assured the dairyman of one result, he was on his way out of business. And in far too many cases these dairymen gave loose-housing a "black-eye" in the minds of sanitarians who are now reluctant to accept milk from loose-housing systems.

As educators we have been accused of giving dairymen too much "off-the-cuff" and "piece-meal" information on loose housing. Maybe, we did forget, or couldn't keep the dairyman's attention long enough, to tell him all the facts about managing the manure pack, arranging feeding and traffic lanes that could be easily cleaned every day and how much space would be required for a good loose housing system. It is also possible that he did hear us, but didn't believe what we said because each discipline



had its own recommendations and sometimes the same disciplines in other states had different recommendations. Very few, if any states, had an objective program approach to teach dairymen how to properly assess his housing situation considering all alternatives. We were usually peddling some individual ideas on loose-housing.

Furthermore, we don't have to limit these varied opinions to loose housing. There appears to be some differences of opinion between disciplines and states on conventional stall barns as to: size of stall, depth and width of gutters, ventilation systems and etc. Yes, we even have some states who want to combine stall barns with a milking parlor while others object to the idea. Thus, how can we wonder that the dairyman is confused and decides on a housing system completely foreign to any individual's recommendations? He may be the smart one and then we will praise him as an innovator, if his system works. The innovator usually assesses all the facts and then moves in a direction that fits his needs to go from where he is to where he wants to go.

#### Educational Team Approach

I am afraid that many of us are guilty of "waxing enthusiastically" about some pet idea we may have on dairy housing, usually related to a few specifics. The needs of the dairyman could best be served through an overall educational program embracing economics, engineering, dairy and any other related disciplines. The dairyman needs all the facts from all educational disciplines, so that he can make a sound judgement decision on dairy housing for today and 20 years from now.

I don't believe that we need to worry too much about which piece of equipment a dairyman purchases, nor how he will finance it. There are usually plenty of salesmen and loaning agencies to handle these problems for him. We should address ourselves to his overall needs in dairy housing, using all the specialized talents available on each University Campus.

Pieces of information on dairy housing are easy to throw out for farmer consumption. An integrated, aggressive educational program doesn't come so easy. I believe that our objective should be to place ourselves in a position where we can all say, "we have an integrated educational program to help dairymen make dairy housing decisions that will improve their competitive position and level of living."

The team approach on dairy housing will not be easily developed. Developing the team will be an educational process within itself. The dairy specialist must watch the engineers at all times or they are sure to recommend a structure that is totally unsuitable for cow comfort, disease control or market requirements. The engineer must watch the dairy specialist or he will recommend a structure to fit the cow but



not suitable for automation or a sound building structure. Then the economist, who has been telling us for 20 years that all below average dairymen have been losing money, is sure to complicate any recommendations the dairy specialists and engineers agree upon. However, the final recommendations made through such a team approach will be far more acceptable to the dairyman. This approach will encourage a state-wide and even a regional program on dairy housing as contrasted to the dissimulation of bits of information as we too often do it now. Thus, we would become program oriented rather than information oriented. The dairyman is already program oriented. He wants all the facts -- however, he asks for pieces of information because we have not educated him differently, to ask for all the facts.

#### HOW A COUNTY AGENT APPROACHES THE DAIRY HOUSING PROBLEM WITH AN INDIVIDUAL DAIRYMAN

David T. Smith  
Associate County Agricultural Agent  
Otsego County, New York

It is indeed a pleasure for me to have the opportunity to hear the discussions which have taken place here today. This is a rather rarefied atmosphere for a county agent. Many of the points that I shall try to make have been eluded to, and in some cases discussed at some length. It is my hope, though, that I will be able to describe for you the approach to dairy housing that is being used in Otsego County, New York. First of all, it probably would be good to describe for you the situation in which this Extension program has taken place.

It should be very clear at the outset that this program has been worked on at various times by Dale Brown and Earl Feinman, as well as myself, and it certainly represents no great initiative on my part. It is also important to note that the experience of the staff in Otsego County has made it much easier to do some of the things described. Earl Feinman and myself have both been in Otsego County since 1956 and Dale Brown has been county agent in Otsego County since 1950.

Otsego County according to the census data for 1959 is the fifth largest dairy county in New York, comprises about 1600 commercial farms with 50,000 dairy cows. The sales of agricultural products in 1959 amount to 21 million dollars, 75% of which was income from milk and dairy cows. It is safe to conclude that dairy is the principal agricultural occupation. In addition to these facts, it is important to note that Otsego County is a rural county. It has a small city and numerous very small villages, but in practically anyway that one might look at it, it would



have to be described as a rural county. There are not very many alternative opportunities for dairymen off the farm. This means that there are a considerable number of farms operated which probably wouldn't be if profitable alternatives were available for the dairymen who operate these farms.

The Agricultural Department of the Extension Service Association has 1900 members, 250 volunteer committeemen, and the three agent staff previously described. The program has been organized with the help of program planning committees. A program has been carried out for dairymen which includes breeding, feeding, herd health, agronomy, agricultural engineering and farm management. In addition to the dairy program, formal programs are carried out in poultry, livestock, vegetables, floriculture, forestry, home grounds and public affairs. I mention this to point out that the program in dairy housing is in no way a program that has been carried on in vacuum, or without reference to other problems. It has been tied in closely with all of the other work that has been done.

The agents in Otsego County since 1954 have consulted with 291 dairymen in regards to dairy housing. In addition to this, there have been numerous times when recommendations have been made as to stall sizes, girder dimensions, or any of the other various and sundry kinds of construction questions that folks ask about. Of the 291 housing situations, 33 have been new barns, 61 have been remodeling jobs, 88 have been in regard to barn additions and 109 have involved both remodeling and a barn addition. These figures give you a little insight as to the size of the group with whom the agents have worked during the last eight years.

#### Problems Agents Face

Before talking about the procedure we use, we should look at some of the problems which agents face in helping farmers reach the most acceptable solution to their housing problems. I'm aware, just as you are, that there are many dairymen who don't go as far as they could, and maybe should, when they remodel or build new dairy housing, but I would submit that there are many legitimate reasons why the most acceptable solution will fall short of what you or I might think would be the most desirable situation. The solution to a housing problem should be acceptable to the dairyman involved. More about this as we go along, but it should be pointed out here at the outset.

When an agent receives a request for help in dairy housing, he is almost certain to find that the farmer doesn't know exactly what he wants. Yes, he has decided that he should do something about housing and he may have pretty well decided that this, or that, or some other solution is just what he needs, but he is not sure and very frequently just a few questions point out that he is open to practically any suggestions that an agent can make. This is understandable because most dairymen have a limited experience with housing.



Practically all of our housing is of the conventional stall barn type so the dairyman has not had an opportunity to see other kinds of housing. In addition, he has done chores in very few barns other than the one that he operates. Many dairymen have ideas that they have obtained from reading the popular farm press and from various salesmen who may have called on them. I would suggest that most of these dairymen can be sold just about anything, providing that the salesman is convincing.

The effect that each new barn or addition has in terms of reputation for those that are involved with it, it has been brought home sharply on numerous occasions. Each of these buildings, regardless of who designs them, or whose ideas go into them, represents a monument that will stand for a long time to come. If these monuments represent happy solutions to a housing problem for the dairyman who is involved, then the monument is a good one and one of which we are proud. But, I'm sure all of us can think of some such monuments that we wish weren't there, and could be plowed under as we might plow under a poor crop variety.

A second problem that agents encounter very frequently is the fact that many dairymen have consulted many other before they contacted the agent. To a large extent they are at the mercy of their builders and equipment salesmen, unless they get help from consulting engineers or Extension agents or specialists. Builders particularly, have a marked effect on dairy housing and we have been too slow to work with them in trying to improve dairy housing. Unless builders have some help in barn design and selection of members, their barns become stereotyped and they tend to repeat the same mistakes in each barn that they build. For this reason, I say that it is high time that we did the best possible job to reach these builders in terms of construction details, size of members, all various things that go into making satisfactory housing solutions.

Some equipment people present a problem because they're promoting a type of building that fits around their equipment. Occasionally we find dairymen getting in trouble because they have a building which was designed for certain equipment but may not meet all of the requirements as far as cow comfort, the ability of the folks who are doing the chores, or the financial position of the particular farm family.

A third problem which is an important one, is the problem of time when working with a family on a housing problem. Many of the requests we receive come from situations where a man is interested in starting his building tomorrow. The pressure is on an agent to produce very quickly. With practically all of the requests we get, this is the case, except those with whom we have had an opportunity to work either in a dairy barn workshop or through the Farm Management program. It is a real challenge to an agent's ingenuity, to slow some of these folks down and get them to take a longer look at what they are doing, and what they propose to do. This is a real problem and I'm not sure that we have as many good answers to it as we might have.



The fourth problem that we find increasingly complex is that of using stock plans to fit what families need and want. When I first started working in dairy housing, I drew a great many detailed drawings, as well as detailed bills of materials. At the time it was good because of the experience gained. I'm happy that I have been able to get away from this to a large degree, mainly because of the great time commitment that you have to make in order to provide detailed plans. Stock plans are very useful in many situations and very frequently we provide them to dairymen. But for the bigger jobs, it is more and more difficult to have stock plans accepted by the dairymen, particularly if there is radical difference between what he has proposed and what the stock plans show. This represents a challenge to us, and I am not at all sure what the solution to this one will be.

### Acceptable Solutions To Housing Problems

Let's turn our attention to the consideration of what an acceptable solution to a dairy housing problem might be. I think you will find that in my discussion here, I am oriented toward the dairyman himself. I think the solution must be acceptable to him above all else. Each dairyman has numerous alternatives some of which are never discovered. Hopefully we help him discover the ones which are most appropriate in his situation. Many of these dairymen can certainly continue, at least in the short run, as they are now operating. Many of them have a choice of whether to remodel or build on the present barn, and some have the additional choice of building a new barn, somewhat removed from the present structure. Some few are in a position to relocate completely, and probably more should consider this alternative.

Acceptable solutions, first of all, fit the farm operator. I would like to suggest to you that each dairyman has a level of management capability somewhat different from any other. In other words, if you milk cows, your management level might be shown in a herd average of 11,000 lbs. per cow. Mine might be at an average of 7500 lbs. of milk. I'm not saying that this management level cannot change, but I am saying that the relative level of success that this man has enjoyed in the last few years predicts to a great extent the level of success he will achieve as he moves ahead. Occasionally you can find circumstances where, with some minor changes, great management improvement results. Most folks have plugged in all of the good management that they can bring to bear. Most know many things they should do differently; for various reasons they work at these slowly. I suggest that in a new situation, most dairymen will not progress much faster than they have in the past. A dairyman's success depends primarily on his ability to organize a business that he can manage.

Besides this thing of management ability, I am sure his financial situation has to be understood. It is of critical importance frequently, in deciding whether or not to change housing at all, and certainly with new housing. In addition to these two considerations, I think that the appearance of the building in terms of the way the operator feels about



it, and the fact that he should like to work in it, are also important in deciding just what type of structure might be considered. This perhaps is not as important as some other considerations but I think it bears directly on the problem and certainly shouldn't be overlooked.

Of distinctly secondary importance to finding a solution acceptable to the dairymen, is the idea of fitting housing to the farm on which it occurs. We see many farms where a man is hemmed-in in several respects, and in some of these situations spending a great deal of money on new dairy cattle housing may be questionable.

If we can answer two or three questions, the housing that is erected will fit the farm, and problems of this sort will not occur. First of all, we should raise a question about whether or not the resulting farm operation will be reasonably feasible to operate. Could a relatively large number of dairymen go on to this farm and be expected to operate it relatively successfully? Such things as the amount of labor required to do chores in the barn, and perhaps also an indication of the net income that might be expected from this unit after the changes under consideration have been made, are important.

Does the proposed barn make the farm itself a "pink elephant"? We occasionally see buildings erected which for one reason or another make a particular farm somewhat of a monstrosity. Perhaps the value of the farm with an expensive barn has to be too high if resold. Occasionally we see buildings put up which are not adaptable at all to other uses. Any of these things might make a "pink elephant" of a farm if somebody else wanted to use it for dairying. From all of this, I would hope that perhaps a process has been evolved to help a family think through their situation and see some of the alternatives that are open to them, evaluate these alternatives to the best of their ability, and decide on the most acceptable solution.

#### A Procedure For Arriving At Acceptable Solutions To Dairy Housing Problems

I have elaborated in detail some of the things that I think are problems, and something about the solutions which we would like to see farm families come to, as regards dairy housing. Let us think about the process that we try to go through with each family who is considering changes in dairy cattle housing. Working with families with whom the agent is unacquainted is usually a much more time consuming process than working with families well known to the agent. To work with a family who has been in the Farm Management program for a period of time is much easier, because they are already thinking beyond their present situation.



Practically all of the requests for help with dairy housing are answered by a farm visit. A farm visit has the advantage of having the family feel at ease and having the buildings close at hand when the time comes to study them. Usually on the first visit, the agent is on the spot because folks are anxious to start construction. So very often an agent finds himself in a position of having to stall for time at this first meeting. This can be done relatively easily by raising questions with the family. This has a twofold purpose. First, to try to put the family in a position where they can look objectively at their situation, and begin to spot some alternatives that may be open to them beyond the one that they may have in mind. In addition to this, it has the advantage of giving the agent an opportunity to assess the situation in which the operator finds himself. It's a real challenge to an agent to be able to form the kind of questions that will challenge the family to look for alternative solutions to their problems. With a little experience an agent can raise the kinds of questions that will provoke the family to think through the situation and reveal alternatives.

#### List Alternatives

With some direction from the agent, it is often easy to get the family to list their possible alternatives. Every family will not be able to look objectively at their situation and propose some alternatives. Experience varies all the way from the family who asks a direct question and about the only answer you can give him is the size of the girder or joist that he's asking about, to the situation where the whole process can be stopped, backed up, and help given in having the family take a good look at the situation.

It is our aim to go through the complete process with just as many of these folks as possible. It is our goal in every contact to raise all of the questions possible to direct their attention at their total situation. With many strangers, you are fortunate in one afternoon to get to the point where folks can list all of their alternatives. Hopefully, though, in consideration of pressure for time, after spending a couple of afternoons with a family, they should be in a position to begin to see some of the alternatives that are open to them.

#### Evaluate Alternatives

At this point a family needs to evaluate each of these alternatives as carefully as possible. This evaluation of alternatives provides one of the great challenges to a county agent or to an extension specialist. As extension work continues to go ahead, I think that we will find that this problem of evaluating alternatives, will probably be one of the most time consuming situations in which we find ourselves. More and more of the requests we get resolve themselves into consideration of alternatives in order that the most acceptable solution to some problem can be discovered.



As far as working with families here in evaluating alternatives, this frequently is done too quickly, usually because families have pre-decided what they are going to do and have accepted very easily the reasons that have led them to this decision. Often it is impossible to get back beyond the course they have already decided upon to help them take a real objective look at some other alternatives. Ideally, each of these alternatives should be looked at in depth.

I really can't describe any particular procedure here. The way to start is to write down the facts about each of the alternatives. Usually before you are done, you are looking at the inputs as opposed to the projected returns. Extension here has a real obligation to discourage families from jumping into a situation which may be as bad or worse than the one in which they presently find themselves. If we do nothing more than help these folks find a solution that is better than the existing situation we have probably justified our time and effort. It is often not such that it will allow the kind of net income that a family expects without major adjustments.

After a family has evaluated these alternatives that are open to them and have decided what they should do, an agent is in a position to help them formulate a plan, formal or informal, that will help them implement the decision that they have made. Frequently in this situation, you are involved with the firm who is providing credit, with builders, with much of the industry allied to dairy farming.

I have emphasized the importance of helping a family study their situation before deciding on a dairy housing change. In my experience, a proposed housing change is often the best place to get folks to take a good look at their situation. With these points in mind, let's think about the kind of technical assistance that we are able to provide as these folks plan the dairy housing that they are going to use.

#### Help In Planning Dairy Housing

Once a family has decided to move ahead with a dairy housing change, we try to have them think briefly about some of the different types of dairy cattle housing beyond their own experience. In most cases, for various reasons, they decide that they are going to go ahead with a conventional pattern. This is all right, but it is our obligation here to try to help them see beyond their own experience.

Several decisions should be made by a family prior to considering the multiplicity of small details involved in planning a structure to house dairy cattle. Usually personal preference makes a decision as to housing system relatively easy. This is not true of deciding what type structure should be used. Until the late 1950's, nearly all of the additions and new barns built in Otsego County were of the conventional  $1\frac{1}{2}$  or 2 story



type. Since the construction of a single story pole stanchion barn in 1954, many dairymen have taken a new look at dairy housing. The third major decision involves the selection of building materials. These are more complicated with each passing year.

In order for a dairyman to arrive at the three decisions just described, it is highly desirable that he see several other barns and talk with those who operate them. Two techniques have proven successful in motivating farm families to look closely at other barns. The one used most commonly is to leave a list of dairymen whose housing should be visited. Usually a family that is interested in revamping their dairy housing will visit such a group of farms. Frequently, tours to a group of farms having new dairy housing have been arranged. These are advantageous because they make good use of agent and specialist time and allow pertinent facts to be pointed out. Sometimes such tours have been open to large groups, but more often are informal and involve two or three families who are ready to move at one time and are interested in similar housing questions.

In helping a family think through proposed dairy housing, a cross-sectional drawing is most valuable. Practically all dimensions can be inserted, and many questions raised which might otherwise be overlooked. A consideration of the cross-section is an easy way to iron out details that either are not shown, or will be at variance with a stock plan that is being used.

The question of plans usually arises fairly early in the discussion. Recently, we have been using a large number of plans from the Plan Service at Cornell. In some instances it still seems desirable to make rough sketches of floor plans while at the farm. This can usually be done in 30 minutes or so. An estimate of materials needed is occasionally requested. Usually lumber and concrete are of most interest. When requested and not available with plans, some help is usually given to dairymen in determining quantities of masonry units, concrete and lumber.

An agent who is often faced with dairy housing requests should find most of the following equipment essential: a 100 foot steel tape, a 10 foot pocket rule,  $8\frac{1}{2}$ " x 11" book of graph paper, 17" x 22" sheets of  $\frac{1}{4}$ " graph paper, a drawing ruler and pencil, lumber calculator, slide rule and note pad.

#### Agent Training

Most of the technical training received by agents in New York has been gained on the job. The regular training schools presented by the Department of Agricultural Engineering have given agents an opportunity to study the basic principles underlying the problems faced in the field.



Frequently, consultation with Extension Agricultural Engineers, particularly in the first years of service, is invaluable in teaching agents to analyze engineering problems, and where to look for solutions to these farm problems.

In New York, a considerable amount of agent to agent exchange takes place. This appears to be very effective and probably should be encouraged to an even greater extent. Agents are faced with many similar problems, the solutions to which are often worked out differently. These methods that are devised are useful to other agents.

#### Non-Farm Groups

From time to time opportunities occur to work with groups other than farmers. As previously pointed out, we have been too slow to plan programs to reach builders. Such a program is now under way in Otsego County. Firms handling building materials, and those offering barn equipment for sale, need help in dealing with their customers. If done carefully, extension can provide much needed information to these groups.

It has been a pleasure to attend your conference. I am sure that you will see your objectives reached as you work together each year. You have left a very favorable impression with me because it has been obvious that you are looking at dairy housing across the discipline boundaries. This has not been done often enough.

#### COORDINATING EFFORTS INTO A UNIFIED PROGRAM

Harry J. Poorbaugh  
Assistant Director for Programs  
Agricultural Extension Service  
Pennsylvania State University

All Extension services have a common problem -- Scarce Resources. Limited budgets, limited personnel which limits the range of competencies which can be acquired through staffing, limited time available to anyone project in the over-all program, limited facilities for preparation of publications, visual and other teaching aids and limited research upon which to draw are typical of the scarce resources.

It, therefore, makes sense that States with common problems should seek to pool scarce resources to increase or improve its educational offerings.



We recognize of course that extension administrators must depend upon its staff personnel for the decisions about what is offered in any particular subject matter area. If we are to gain by cooperation between States, this means that we must find ways to resolve differences and improve communications among specialists so that we can have free exchange of publications, methods and teaching aids.

Last year for example, Pennsylvania purchased 37 publications from other states. I'm sure that publication needs in the counties would be better satisfied if there had been many more such purchases. In fact in reviewing the publication situation with county staff members they suggest that we expand use of publications developed in other states.

Why haven't we? In some cases simply because certain portions of a publication were not acceptable to our specialists.

This condition can be improved by better communication between specialists of the various states during the period of preparation so that the publications will be more generally useful. Such improved communication might be helpful if applied to project development, to visuals and all kinds of effort made in performing the various functions for which the specialist is responsible.

The suggestion made by Director Davison early in this workshop regarding the new committee to carry forth this excellent work performed by the present groups indicates a desire on the part of administration that this flow of ideas, of interchange and desire to undertake joint action be fostered.

We must bear in mind that this is just one important phase of the work of the members of this group and of the entire extension program. The directors must develop policies which will permit the development of a total program consistent with the resources at their disposal.

Each state also finds its resources strained in the implementation of projects. Inservice training and other means of communication needed to get projects launched and carried out are major cost factors that must be reckoned with.

Do we now have existing channels of communication between disciplines in the states that might with more thought be improved to provide for a better flow of information? What built-in provisions do we have to alert each other and administrators? How about exchange of new ideas? How long does it take for our specialists to learn about something that has made an important impact in another state? Might this be a point of initiation for progress in the interdisciplinary process we have been talking about here?



I am confident that if Directors know of an important new development, they will find ways to bring members of their staff into direct contact if that appears the thing to do.

My point is simply this - that as states

- a. Each of us faces a need to improve our Extension program.
- b. The problems that stand in our way call for more resources than any of us alone possesses.
- c. We have here demonstrated a value in coordinated effort within our state staffs and between states -- this value being that we have pooled ideas and increased understanding about the various aspects of this problem and of the educational approach we are undertaking.
- d. By so doing we are making wider use of scarce resources.
- e. We must find better means to assure a continuation of this coordination both within and between states.
- f. I believe that Directors and other administrators will applaud and support cooperative efforts by their staffs to develop new and economical means to assure continued coordination.
- g. Within any framework for coordinating these competencies there are ways to retain the ingredients which provide professional and personal satisfactions and which encourage creativity at all levels. Properly designed problem solving approaches will permit the differences necessary if the people, the county staffs, the state specialists and administration are to feel that this program is its own.

In view of the growing complexity of the problems with which we deal and the rapidly expanding store of knowledge being amassed, the need for all of the roles expected of the Extension specialist is bound to grow in importance.

All extension services are concerned with such questions as -- How can we maximize the contributions of our specialist staff? How can we develop educational programs which will come to grips with the problems of people in a manner in which people will relate?

It is pretty clear that our future success lies in a growing excellence of Extension personnel. Each specialist has responsibility for providing a particular expertise needed by the Extension Service of which he is a part. To the extent that his performance falls short of the best possible - the resources of the Extension program are weakened.



Another concern is that of finding ways to tap this competence to interpret and communicate throughout the entire process of developing and carrying out the educational program.

We need also to recognize that as the actual problems which our clients face become more complicated. We in Extension are being looked to for more comprehensive educational assistance.

While the people we work with may recognize our organizational need for specialization -- we also should recognize that they do not departmentalize their quest for solutions in a like manner. The solutions to an individual's problem usually results from fitting a number of pieces together. The actual decisions about fitting pieces together should properly rest with the client. But, if we would present an educational offering with a stronger purpose, our opportunity lies in not only showing what the pieces are but in how they relate and why they need to be included.

Placed in their proper perspective each part becomes an important factor in the answer for which he is looking. The total program thus assumes an increased importance and added attractiveness. We ourselves begin to deliver with more impact as we see the relatedness of the parts of technology and management which we have to offer.

Administrators of the Northeast region have indicated their belief in the value of this approach by sending us to this workshop. They have faith that the demonstration that is taking place here is worth the cost. They see in this effort a means of strengthening the offerings which will follow in their states. They are confident that the public will appreciate and applaud the evidence of greater excellence that will be displayed in working together on a problem of such importance.

Now, briefly, I would like to discuss the way we in Pennsylvania have been attempting to coordinate our efforts through program development.

In 1959 the Director effected a simple reorganization for programming. Two Program Development Committees - one of four specialists and one of six County Extension workers was appointed - each member to serve three years.

All specialist sections were grouped into four categories or disciplines. These were animal, plant, social and physical sciences. The four specialists are chosen to represent each of these groupings.

Both committees work with the Assistant Director for programs and with or through him are advisory to the Director.

These committees work separately but once every two months hold a joint session to discuss matters of common concern.



I will not go into details concerning the objective responsibilities and authority of these committees but rather I will outline how we will probably move in developing a program based on the matters under consideration at this workshop. This predicted procedure is based on patterns which we have successfully established in launching other interdisciplinary projects.

The steps would probably be as follows --

- Step A - The problem and the results of this workshop will be discussed at a Specialists Program Development Committee Meeting.
- Step B - The committee will recommend to the Director that an interdisciplinary committee be set-up to study the situation, set-up objectives, and lay out a plan for action including the subject-matter, the materials needed, the audiences to be reached, an operational procedure with a timetable and an indication of the inservice training needs.
- Step C - Upon completion of the Program Plan the sub-committee would report to the Specialists Program Development Committee for its approval.
- Step D - The County Extension Workers Program Development Committee will then review the proposal and make its recommendations.
- Step E - After both committees have approved the plan it will be presented to administration. Decisions will be reached as to the feasibility and extent of support that can be given, the priorities it will receive etc.
- Step F - Execution of the plan as agreed to by Administration.

This procedure has been found quite workable. There does not appear to be undue delay in the process and there is more disciplined, advanced planning. Those who participate have found satisfaction and our public has responded favorably.







## FUTURE CONSIDERATIONS IN DAIRY HOUSING

In this section of the report you will find papers on future economic problems facing Northeast dairymen, dairy housing systems today and tomorrow and public health regulations related to them, and some important management implications associated with larger dairy farm businesses.

### FUTURE ECONOMIC PROBLEMS FOR DAIRYING IN THE NORTHEAST

William C. Welden, Economist  
H. P. Hood and Sons, Inc.

The subject assigned to me is one of major significance to the rural economy of the whole Northeast because dairying is by far the leading source of farm income in this region, with a total farm value of well over one billion dollars per year, plus the value of calves and cows sold for slaughter. The subject is doubly important because there undoubtedly are many very complex and as yet unsolved economic problems ahead of us here in the industry of dairying in the Northeast. I appreciate very much, therefore, the honor and the confidence you bestow upon me and my company by asking me to talk on this subject. My approach to it reminds me of the old Senator from Minnesota as he went back home from Washington to face his constituents. He always said to his audience: "Ask me any question you like and I will answer it as best I can. If I cannot answer the question, I can surely discuss it at length."

Forecasting the future of anything has always been and remains today a very attractive avocation. The rewards for better than average results are quite lucrative. The hazards are extremely high. The average results appear to be getting somewhat better as time goes on, but the batting average is still not high enough to make any economist or other forecaster eligible for the Hall of Fame. Just as one example, I do not think I can recall any time when there was so complete a degree of unanimity as there was in December 1959 and January 1960 that 1960 would be the best economic year yet on record. It turned out to be lousy. I am sure this massive disappointment was a decisive factor in the very slim margin of voting for a new party President. The forecasters were wrong, economic conditions turned downhill, and Candidate Kennedy capitalized on the turn. The results of this economic mistake are overwhelming -- for the better, I hope, in the long run.



In our complex and dynamic society today we can make about three generalizations about the art and science of forecasting the future. The first generalization is that the future will almost certainly represent a substantial change from the past. This has almost always been true. The second generalization is that it is practically impossible to forecast in the economic or social field with a really high degree of accuracy because the influential factors are changing constantly. The only really phenomenally accurate economic forecasts have been institutional accidents. The third generalization is that when studied in retrospect or after the fact, past events have almost always provided an intelligent clue or a prelude or a prologue as to likely future developments.

These three generalizations may seem to be inconsistent. They may seem to say that you can forecast the future, but that you cannot do so accurately because it will be different from today in a way, in a degree, and for reasons perhaps now unknown. They are not really inconsistent, but just realistic. What these generalizations mean is that the future will almost certainly be different from what we now know, in ways and degrees that are in specifics unknown to us today. However, the art and science of economic analysis has progressed to the point where a careful analysis of recent developments should provide some most valuable clues as to the direction and degree of impending changes. What we need to do is to perceive and pick out the significant trends that are under way.

More importantly, perhaps, we need to understand how we might influence these significant trends so as to influence future changes in the direction that best serves the public interest. When I came with H. P. Hood & Sons over 16 years ago as their economist, I tried to come as an analyst and not as a forecaster. My small department has been forecasting ever since -- prices, sales, population, income, supplies, etc. Modern business demands forecasts. We have never yet made a forecast, however, which did not result in some company action that made our forecast obsolete within a month or so after it was made. Our record, therefore, looks lousy. If we forecast a milk shortage, they take special steps at once to buy more milk. If we forecast a sales drop, they begin immediately new advertising and sales promotion programs. The immediate company objective is to upset the forecast unless it is just the right degree of rosiness, which is never the case because of change.

The big subject which your program committee has given me seems to divide itself into about four main parts. When you try to think of all the many economic problems that Dairying in the Northeast may have to meet in the future, you think first of the consumer demand for fresh fluid milk products in this region. Secondly is the problem of the relative productive efficiency of our dairy farms. Thirdly is the economic organization and efficiency of the marketing and distribution machinery that bridges the gap between the producer and the consumer of milk. Fourthly is the complex issue of what role State or Federal government should or will play in each of these first three issues or in transcending them all to regulate the dairy industry more completely.



These four main parts are not separate and independent of each other, but are so interwoven that it is almost impossible to separate them on many issues. Take an issue such as concentrated sterile milk, or milk marketing quotas, or prolonged price wars, or no hauling charges on bulk milk, and you discover ramifications all through the Dairy industry. In spite of this internal complexity, it is probably best to divide the discussion into these four parts. Such a division helps also to distinguish between our Northeast region and some others across the nation.

There are serious and important problems ahead of us in each of these four areas, and I think it is more important that we all understand the problems than it is for anyone of us to try to forecast whether or just how they will be solved. For that reason I am going to do more discussing than forecasting with respect to dairying's future problems. I want to assure you in advance, however, that despite my emphasis on future problems, I feel most sincerely that we can and will solve these future problems, and that if we go about this solving as we have in the recent past, the future outlook for dairying in the Northeast is excellent. Every troublesome problem is often another opportunity for progress. We have made this proverb come true in our Northeast dairy industry in the past, and it has paid good dividends, and we can and must continue to do so in the future.

#### I. Consumer Demand For Fresh Fluid Milk in the Northeast

Per capita consumption of fresh fluid whole milk is probably the number one economic problem of the dairy industry today. Last year for the nation as a whole, total consumption was down slightly while population was up by  $1\frac{1}{2}$  percent or so, which means that per capita milk consumption was down almost 2 percent. Here in the Northeast, Philadelphia shows the worst record and New York next worst, both worse than the national average. New England markets are about the only bright spot in the nation. The whole Northeast picture, however, is not much if any better than the national average.

Up until the last year or so it seemed that fresh fluid milk consumption was holding up pretty well except in a few special markets. Low-fat sales were gaining, as were cheese, cottage cheese, and ice cream sales. Butter sales have been losing the oleomargarine battle and fluid cream has been losing the diet battle. Evaporated milk sales have been losing sales to powdered milk and lower-priced fresh milk.

Our traditional economic studies of the demand for milk have told us that population is the key factor. If income and price stay the same, and population goes up 10 percent, then milk sales should go up 10 percent. If population and price stay the same and income goes up 10 percent, then milk sales should go up 2 percent. If population and income stay



the same, but price goes down 10 percent, then milk sales should go up 2 percent. Price and income are only one-fifth as important as population.

The experience of these last few years has shaken tradition quite severely on some of these points. The ethnic or racial make-up of the population may be much more significant than total numbers as far as milk sales are concerned. Income may cease to be a significant factor above a certain level. Price may be a significant factor only to those families below an income level which we are rapidly leaving behind.

Fresh fluid milk sales in recent months have also been buffeted (1) by the whole big problem of diet and weight, (2) by the problem of heart disease or cholesterol in relation to animal fats, (3) by the antibiotic and chemical residue problem, (4) by the atomic fall-out problem, and finally (5) by the bad publicity from milk strikes and charges of anti-social activity. All of these developments hurt the demand for milk because they undermine the years of work we have done to create an image of fresh whole milk as nature's most perfect food, necessary for good health and good nutrition; and to build an image of our industry based on service, quality, and integrity.

The future poses a really serious challenge on fresh whole milk demand in the Northeast. We not only have these 5 major public relations issues, but we have the new big challenge of the new concentrated sterile milk. At the moment it seems more serious than the challenges we have met in the past from evaporated milk, whole milk powder, non-fat powder, sterile whole milk, and concentrated fresh milk. We met all these by flavor, quality, service, efficiency, education, etc., and we still have the same weapons. We must realize, however, that the consumer demand we have built is a most inviting target and it will be shot at frequently and hard. Meeting the challenge is going to take some very hard work and closely coordinated work by the whole fluid milk industry. I think it can be done because it has been done in some markets - such as Boston, but it really takes concentrated coordinated work.

## II. Milk Production Efficiency on Northeast Dairy Farms

On this part of my subject I am almost at a loss for words to describe the full scope and magnitude of the efficiency revolution that has taken place in American Agriculture, including Northeast Dairying, over the last 10 years. I do not believe that there was anyone who would have forecast in 1951 that by 10 years later in 1961 milk production per cow would be up 25 percent, and milk production per farm would be up 90 percent. I do not believe that there has ever been such a sharp and major change in productivity over such a short period in our whole dairy history. Part of our whole farm problem is due, of course, to the fact that there have been similar changes over this same period in respect to corn, broilers, wheat, potatoes, and other lines.



Research has been at work, economic education has been at work, and economic pressure has been at work, to bring about these changes. In our dairy field we have had better feeds and better feeding, we have had artificial breeding and better breeding, we have had both better and more efficient housing, we have had better and more efficient handling practices for feed and for milk itself through bulk handling methods and otherwise.

It is very hard to say what the future may bring on this matter of production efficiency for milk here in the Northeast. There is still lots of room for progress on production per cow. Maine, New Hampshire, and Vermont are still 20 percent below New Jersey, and I am sure New Jersey will keep growing. There are similar differences on production per farm.

Major changes such as those we have had in the last 10 years have come about partly from new knowledge becoming available, but partly also and perhaps more largely from economic pressure. People change things not only because they can and they want to, but more largely because they are forced by economic pressure to seek out new ways of doing things.

Let's suppose there is actually a complete flavor break-through on sterile concentrated milk, and that in order to meet the challenge the Class I price in the whole Northeast has to go down 2 cents per quart -- the Blend down by 1 cent per quart. How would our Northeast dairy farmers meet this challenge on production? Some would leave, of course, but others would look for new ways to increase their efficiency. Dairying would still be the leading farm industry in the Northeast.

Let's suppose next that every dairy farmer in the Northeast is given a milk marketing quota equal to 90 percent of the whole milk he sold in 1961. All of a sudden the farmer has to increase efficiency by reducing inputs per unit of output, rather than by increasing output per unit of input. I hope that our economic extension education is up to date on this job. Somehow I have a feeling that when you fix the output, as quotas would do, you limit substantially the chances for greater efficiency. Greater efficiency must then come only from reduced inputs, and the input factors generally come in bigger chunks. The whole switch from emphasis on output to emphasis on input seems to me to make it considerably harder to continue the growth of efficiency. I am sure anyone who has ever run a milk route or a milk plant will verify this conclusion.

Let's suppose finally that the Secretary of Agriculture on April 1, 1962 reduces the price support on manufacturing milk by 29 or 30 cents per hundredweight, through reducing support prices for butter, non-fat powder, and cheese. The direct effect on the Northeast would be to reduce the blended price by 12 cents or so per hundredweight. However, it would rekindle the whole economic issue of Northeast versus Midwest on Class I price levels because the Midwest Class I levels would drop by the same



30 cents since they are tied directly to manufacturing milk prices. I am sure the Midwest dairymen would make plenty of political noise if their Class I prices dropped this much while our Class I prices here in the Northeast did not change at all. This may well result in another major hearing to reconsider our Class I prices.

I think all of these problems plus the continued upward creep of inflation mean that we must expect the economic pressure for more and more efficiency of milk production to continue unabated. There is clearly still room to grow, and I feel that we must and will continue to take advantage of every opportunity such as those which you people are providing.

### III. Marketing Changes in the Northeast

Major changes on the milk marketing front in the last few years have included the sharp improvements in transportation facilities and in refrigeration facilities which permit milk to travel further. This has facilitated the consolidation of milk assembly plants, milk processing plants and sales outlets. At the start of 1961, for example, there were 74 country milk plants in the Boston milkshed. By the end of the year 11 of these had been closed -- a reduction of almost 15 percent in one year. 1961 was a year of rapid progress in New England on conversion to bulk tank, which means the consolidation of country plants may not be as rapid in the future, but the trend still will persist into the future.

Automation and new and better handling methods have come into the field of milk processing and distribution the same as they have to so many other lines of industry and agriculture. The economic pressure to adopt them comes not only from increasing wage rates for labor, but from the competitive margin squeeze resulting from new companies coming into the business with streamlined or specialized operations. In many markets there have been drastic price reductions in the gross margin or spread between the producer price for Class I and the consumer price for milk sold to consumers by super-markets and specialty dairy store operators, with the biggest reduction centered on the multiple quart or the half-gallon and gallon glass packages. This, in turn, has forced some margin reductions in retail-home delivered milk prices in an effort to try to hold volume on the retail routes, partly through volume discount pricing plans, and partly by introducing the multiple quart containers on the retail routes at lower prices than single quarts.

Various dairy groups, producers and dealers and others, in all of our Northeast States that no longer have state control of resale prices, are seeking some form of legislative help, short of resale price fixing, to try to insure that milk is not used as a loss-leader, to the detriment of dairy farmers or consumers, while these dramatic price and marketing



changes are taking place. It is difficult to say at the moment whether such legislative help can be expected to develop. The states that are involved - Rhode Island, Connecticut, Massachusetts, and New York - are among the most highly urbanized in the whole nation, with over 84 percent of their 1960 population being classed by the census as urban. This means that new legislation affecting resale milk prices has to face a pretty stern test of public interest and consumer protection. The legislators and the governors want to be sure that any emergency price stabilization work which they engage in does not stifle competition and does not impede or inhibit innovations or new developments that might justify lower milk prices to the consumer.

It is extremely difficult to say what the future holds in this area of marketing except to generalize that the milk business is extremely competitive, it has a relatively high rate of wages, and it has a relatively high percentage of labor cost. There is strong economic incentive and economic pressure, therefore, for ever increasing efficiency in the use of labor. Under these conditions we are bound to see more changes in the years ahead. I would hope we could find a legislative or regulatory formula to help make some of these changes on a more orderly basis. By working together perhaps we can.

#### IV. The Role of Government

This brings me to the fourth and final point, namely, the role of government in the future of dairying in the Northeast, and as I indicated above, it may easily be more important than all the others. Government already plays a major role in the affairs of milk production and marketing in New England, not only through Federal and State research and extension work such as yours, but through price support operations on milk and on dairy feed ingredients and through State and Federal milk price control, including control of resale prices in 5 of our 9 Northeast States. Federal milk price control, as you know, has expanded greatly in recent years here in the Northeast, with the major expansion of the New York order into New Jersey and Up-State New York in 1957, the new Southeastern New England order covering all Rhode Island and all Southeastern Massachusetts in late 1959, and the new Connecticut order covering that entire state early in 1960. These are in addition to the new orders for Washington, D. C. and Baltimore, and Wilmington.

Everyone from Washington tells us that even more Federal controls are on the way, including not only more of the same we now have, but some new ones in the way of milk production or marketing quotas for each farm, economic pressure to adopt the U. S. Public Health Service Standard Ordinance, forced removal of all trade barriers on milk from other regions, more intensive control of marketing practices by Federal orders, more intensive control of pricing and trading practices by the Federal Trade Commission, more Federally financed research in both technical and economic fields, perhaps more compulsory financing of market research and development programs, and many others.



Many of these prospective developments are viewed by the Northeast dairy industry with mixed emotions, rather mild in some cases but quite violent in others. The two causing the most controversy at the moment are the proposals for fixed milk marketing quotas for each farm and the more or less forced adoption of the U. S. Public Health Service Standard Ordinance. Northeast dairymen have been quite articulate in their objection to these two proposals, and it looks now as neither would go through in 1962. They are not dead issues, however, and they will be back among us next year and the year after. I mentioned earlier the economic effect that milk marketing quotas would have in reversing the emphasis on future gains in dairy farm efficiency. The U. S. Public Health Service Ordinance, applied to the Northeast, would in my opinion increase the fixed investment on the average farm without necessarily increasing basic quality. It is simply an added insurance burden and cost.

Some of these other government trends may also spell problems ahead. The new provision in the big New York federal milk order which prohibits any hauling or service charge on bulk-tank milk may well slow down seriously the conversion to bulk tanks in that milkshed. As Federal orders expand their coverage, there is more economic and political pressure for uniformity, as witness the big 10-market hearings last summer on surplus milk prices in the Northeast. This trend could well mean eventually that our so-called economic formulas for setting Class I prices here in the Northeast, which to me have worked so well over the last 13 years, would have to be overridden by a ceiling as to the amount our Class I price could exceed Midwest manufacturing milk prices. Another big problem ahead in respect to Federal milk orders is just how they are going to handle the classification and pricing of milk going into the new and reportedly top-flavor canned sterile concentrated milk. If it has to be made from top-quality raw milk and if they price it as Class I out West, then we may have little problem. If they price it as surplus out West, they may have to do the same here in the Northeast, with the result that we may wind up producing it ourselves in this region.

I am personally of an optimistic frame of mind on the manner in which the future economic health of dairying in the Northeast will be influenced by the role of Government in our business -- perhaps unduly so. I believe we can and we must learn to work with Government and to help shape their regulations towards constructive methods and procedures and ends. We have a real rough problem on dairying today with overproduction, underconsumption, budget limits on price support costs, widespread distaste for production quotas, and cost-of-living inflation barriers to higher price levels. It will take time to hammer out a solution that can win the majority support of Congress and of milk producers. Apparently, however, some solution must be found within two or three years. We must be sure that our interests are fully represented.



## V. Conclusions

I am afraid that I have mentioned many more future problems than I have offered solutions, and have raised many more future questions than I have offered answers. The reason for this was emphasized at the outset. Not only is forecasting still an uncertain science, but the most valuable forecast is frequently the most inaccurate in the long run because people immediately go to work to correct or compensate for the direction that is indicated by any forecast.

I think we can perceive from the recent past at least 4 major areas in which we are going to have problems and questions in the years ahead: (1) Consumer demand for fresh whole fluid milk; (2) Efficiency of farm production; (3) Marketing efficiency; and (4) The role of government. Each of these is dynamic for the future because there are major changes ahead in each of them. Experience has shown that a good industry program of action can bring good results. I am optimistic for each of the four areas, but I am also realistic enough to appreciate that we must do an even better joint dairy industry job than we have done in the past if we are to solve best these future economic problems. We pledge you our help and we plead for yours. Thank you very much.

### DAIRY HOUSING SYSTEMS TODAY AND TOMORROW

R. O. Martin  
H. P. Hood and Sons

Northeast dairymen generally recognize that the challenge now and in the future is to reduce the production costs of quality milk. In view of this challenge, many Northeast dairymen are faced with making major changes in their operations to maintain their competitive position in a rapidly changing industry.

Possible methods toward reducing production costs are as follows:

1. Milk same cows at increased production per cow with same total labor and capital input.
2. Milk same cows at same production per cow with less labor and/or capital input per cow.
3. Milk same cows at increased production per cow with less labor and/or capital input per cow.
4. Milk more cows at same production level with same total labor and capital input.



5. Milk more cows at increased production per cow with same labor and capital input per cow.
6. Milk more cows at increased production per cow with less labor and/or capital input per cow.

From a farmstead engineering standpoint, the engineer is directly concerned with methods 2, 3, 4, and 6 and indirectly concerned with 1 and 5. A complete business analysis of the overall operation, conducted by competent farm management consultants, is necessary to determine, first the production efficiency of present operation; and second, if operation is not competitive, which of the above methods should be followed. Major changes in facilities cannot be soundly planned until this is done.

It is felt that a business analysis will make clear the necessity of replacing obsolete facilities on many of our dairy farms. After the dairyman has concluded that major changes in facilities are necessary, he is faced with a multitude of decisions in order to take advantage of more efficient production methods. Some of the more important decisions to be made are as follows:

1. Loose housing system or stall barn system
2. Use old facilities or start from scratch
3. Location of new facilities
4. Assume new facilities to be a loose housing system
  - a. bedding area to provide individual stalls or group housing
  - b. covered or open feeding areas
  - c. covered or open paved exercise area
  - d. milking parlow type and size
5. Assume new facilities to be stall barn system
  - a. one-story with ground level hay storage or hay storage over stall barn
  - b. two or four strings of cows
  - c. cows head to head or tail to tail
  - d. milking parlor, transfer system or around-the-barn pipeline
6. Vertical or horizontal silo
7. Automated, mechanized or manual handling systems for hay, silage, concentrates, bedding and manure

The above questions are complex and involve considerable capital. This alone exemplifies the necessity for sound farmstead planning. Developing a standard system design that will meet the needs of every dairy farm becomes obviously impossible. There are, however, certain criteria that a dairy housing system must satisfy to be profitable:

1. Flexibility for future expansion
2. Maximum cow comfort -- conducive to good herd health and longevity
3. Minimize labor and capital input per unit of production



In summary, I submit that we will continue to see both loose housing and stall housing systems constructed by Northeast dairymen. Many changes in system layout will be made particularly in stall barn systems, to facilitate efficient mechanical handling of all materials in bulk. A milking center, to include milking parlor, milkroom, office and washroom, will become common to each system.

In conclusion, I would like to emphasize the following three points:

1. We must think, plan and design in terms of a housing system -- not just a barn.
2. The cost of a housing system should be evaluated on the basis of annual operating costs and not on only initial investment.
3. As designers of dairy cattle housing systems, we must not become complacent with our present level of efficiency -- we must constantly strive to improve it.

#### VIEWS ON THE FUTURE IN DAIRY CATTLE HOUSING

Irvin R. Fisher, Manager  
Farm Buildings Department  
Cooperative G.L.F. Exchange, Inc.

Our contracting experience over the past two years has shown a definite swing away from the interest in loose housing to conventional. We feel the basic reasons behind this switch from loose housing is the farmer's attitude toward cold weather housing, difficulty in site selection because of increased area, lack of individual control over cattle and the narrowing of the gap between loose housing and conventional barns costwise.

It is my feeling that conventional barns will remain dominant over the foreseeable future in G.L.F. territory. This will be brought about largely by the fact that the real problem in housing is a result of the farmer who wants to increase his capacity 20 to 50% and currently has a very workable two-story barn with adequate hay storage and can expand simply by the addition of a relatively low cost one-story structure.

I do feel, however, that loose housing will play a major role in the future in terms of adaptations which are taken from loose housing to influence conventional barn structures. As an illustration, auger feeders have had their pre-dominant push in loose housing and can be expected



to be applied to conventional barns, either in the form of auger type feeding of cows in stanchion or the adaptation of auger bunk feeders outdoors and the cattle would be turned out to feed at a given time every day.

Milking parlors will, in general, increase in their use with conventional barns because of the labor practices involved with other methods of milking which are eliminated by the parlor.

Single story structures will also become much more predominant in the future, since farmers will face up to the problem of separate hay storage from the dairy cattle structures which represent the bulk of their investment.

Pole buildings, in this particular instance, have already shown their usefulness in loose housing in terms of providing low cost hay structures. These will be adapted to conventional barns setups as hay storage structures and the cattle then housed in single story conventional barns.

On the subject of free stall housing, I cannot at this point predict its future. Observation to date would indicate that there is a severe need to upgrade our quality levels on insulation and ventilation in the limited number of structures seen to date. The advent of free stall housing, however, does indicate very dramatically that there is a trend toward picking the best components of both conventional barns and loose housing systems to blend them together into a more workable conventional dairy housing structure with a maximum amount of labor saving equipment.

#### THE U. S. PUBLIC HEALTH SERVICE LOOKS AT THE FUTURE OF DAIRY CATTLE HOUSING

Irving H. Schlafman  
Bureau of State Services, Public Health Service  
Department of Health, Education, and Welfare  
Washington, D. C.

The interest of the Public Health Service in dairy cattle housing is as old as its interest and activities in the field of milk sanitation, dating back to 1896. Such interest stems from two important public health considerations. First, of all foods, none surpasses milk as a source of those dietary elements needed for the maintenance of proper health--especially of children and our older citizens. For this reason, the Service, has, for many years, promoted increased milk



consumption. Second, milk has a potential to serve as a carrier of disease and has, in the past, been responsible for disease outbreaks of major proportions.

In 1923--more than 38 years ago--the Public Health Service established an Office of Milk Investigations to assist States in the development of effective milk control programs at both State and municipal levels. In 1924, a model regulation, now widely known as the Milk Ordinance and Code recommended by the Public Health Service, was developed for voluntary adoption by State and local milk sanitation authorities.

It is interesting to note that, even in the mid-twenties, the relationship between adequate dairy cattle housing and quality milk production was recognized, and detailed housing requirements concerning such items as dairy barn floors, lighting, air space and ventilation, walls and ceilings, floor cleanliness, cow yard grading and draining, and manure disposal, were all included in the original PHS recommended milk ordinance together with other criteria, related to herd health, milking procedures, milk house operations, water supply and waste disposal. Emphasis was placed on performance--day-to-day compliance with basic sanitation practices--as the key to quality milk production.

The PHS recommended Milk Ordinance and Code has, since its development, been revised 12 times in order to translate new knowledge into public health practice, and the next revision has already been initiated. It currently serves as the basis of the market milk sanitation regulations of 37 States and over 1900 communities and has been adopted as the basic standard of the voluntary Cooperative State-PHS Program for Certification of Interstate Milk Shippers. Now, as in yesteryears, the Milk Ordinance and Code stresses performance, regardless of herd size or housing system.

Since World War II, we have witnessed an almost unbelievable growth and expansion of developments in the housing and handling of dairy cattle. The muscle has been taken out of milking and technological changes have provided the dairyman with means of caring for, and milking, more cows in a more satisfying environment. However, as the trend toward the newer cattle housing systems accelerates and as the farms and herds get larger, several problems of public health significance have become more pronounced. It is desired to briefly comment on some of these particular problems which include herd health and cleanliness, manure disposal procedures, milking parlor operations and water supply and waste disposal systems.

It is especially important that the dairyman, in his enthusiasm for expansion in herd size and production, purchase only healthy, tuberculosis-free, brucellosis-free, and mastitis-free animals from reputable dealers, and subject his herd to test for brucellosis, tuberculosis, and other diseases in compliance with State and local laws



and regulations. In this connection, it is desired to emphasize that evidence of, and subsequent treatment of bovine diseases should be based upon the diagnosis and direction of a licensed veterinarian. Dairyman today can ill-afford the costly, wasteful practice of "playing like a veterinarian." Adequate numbers of calf pens, maternity stalls, and hospital stalls should not be over-looked. Existing stanchion barns, which are either outgrown or in need of extensive remodeling to meet Grade A requirements, can with little modification, be utilized very effectively for such purposes.

Newer cattle housing systems potentially provide dairy animals with more freedom, more individual comfort and more "udder room," and thus, can contribute markedly to the prevention of mastitis. Chaos can result, however, when the dairyman's enthusiasm for herd expansion and increased milk production runs wild. Poor planning of new housing systems and ill-advised reconstruction of existing housing facilities can result in exceedingly over-crowded conditions which increase the possibilities of udder injury and the spread of mastitis. The importance of planning for future herd expansion cannot be stressed enough.

Sufficient and dry bedding are not only key factors in the prevention of mastitis, but are essential for cow cleanliness. In a loose housing system, the loafing area should be so arranged as to eliminate feeding, watering, or cross traffic, and be well ventilated. The manure pack must be dry and well bedded at all times. To keep cows free of accumulations of manure on udders and flanks, the loafing area must be policed daily and enough bedding used to prevent the manure pack from becoming soft and punched up. A high, well-drained site, protected from the sweep of prevailing north winds and from flooding is most essential for a dry loafing area.

With regard to the subject of cow cleanliness, there are other areas of the newer cattle housing systems such as the holding area and cow yard area, which, if not maintained properly, can contribute markedly to the difficult, and sometimes impossible task of keeping the dairy herd clean. Paving of these areas is highly recommended in order to facilitate cleaning. Bedding, hay, and litter should not be allowed to build up in these areas, and failure to observe this recommendation has caused more than one dairyman great difficulties in keeping his dairy herd clean. Certainly these areas should be well graded, drained as well as is practical and free of standing pools of water and accumulations of manure. Swine must be excluded. Proper, as well as sufficient equipment necessary to keep these areas clean should be provided.

Improper manure disposal induces the breeding of flies--a dangerous spreader of disease microorganisms to both man and animal through direct contact and through contaminated milk or milk utensils. As the size of our dairy herds increases, it becomes obvious that the problem of



properly disposing of manure becomes more pronounced. In loose housing systems, the complete removal of all manure accumulation before the fly season is a must and, of course, for maximum benefit, the manure should be plowed under the ground, immediately after spreading in the fields. During the fly season, all manure should be (1) immediately spread upon the fields, (2) stored for not more than four days on the ground surface--and then spread upon the fields, (3) stored for not more than seven days in an impervious-floored bin, or upon an impervious-curbed platform, and then spread, (4) stored in a tight, screened, and trapped manure shed. Liquid manure as a fertilizer is becoming popular in some areas. At no time should stored manure be accessible to the cows. It is desired to emphasize that proper manure disposal--not chemical treatment--is the key to effective fly control on the dairy farm. In the light of the national problem of insecticide residues in milk, attention to this matter is of great importance.

The number of various systems of moving and milking cows in a milking parlor are many. Each system is designed to meet specific needs, such as the number of cows to be milked, the number of men to do the milking, and the financial resources of the owner. Most of these systems are effectively designed to enable the operator or operators to milk more animals in greater comfort, with greater efficiency, and in a shorter period of time. It is gratifying to see so many milking parlor operations designed just that way. It is desired to emphasize, however, that design does not insure performance--day-to-day compliance with basic sanitation practices. Too often, the importance of speed--to get the job done--over shadows the necessity of performing basic sanitary procedures and proper milking operations. Some parlor systems permit over-crowding of animals, and ventilation and splash problems compound. Lighting in some parlors is quite deficient, as is elbow room in others. Without question, the parlor system requires a more informed operator and training of such individuals is a responsibility of all of us concerned with quality milk production.

Additional problems of public health significance which become more pronounced as the trend toward larger dairy farms accelerates, include water supply and waste disposal systems which must be reconstructed, or constructed anew, to serve increased uses. It is of paramount importance that official approval of plans be secured before such work is initiated.

The problems which have been discussed are not new or exclusive to the newer systems of dairy cattle housing. They are basic sanitation problems which may be compounded by the trend toward bigness in cattle housing developments. They are problems which most certainly merit our attention.



What of the future in dairy cattle housing? Prophecy as to the future of anything is always a hazardous business. However, it is believed that the very same factors which have been responsible for the rapid changes in cattle housing systems during the past 20 years provide signposts as to the direction that dairy farm systems will move in the future. Such factors include population growth, growth of metropolitan complexes, and technological changes.

The exploding and continuing shift in population from rural areas to metropolitan centers--65% of our population now live in such centers--will continue to exert a significant influence on the number and size of dairy farms in the country. As metropolitan centers increase in population, they will continue to expand outward--many miles distant--into surrounding rural areas. More and more cropland and pastureland will continue to be converted into suburban developments and into sites for small industrial plants. In addition, many dairy farmers will continue to turn to more profitable types of farming or other occupations. As a result, we have seen, and will continue to see, a rapid decline in the number of farms which derive major income from the sale of milk, at the very time when population growth has created, and will create, additional demands upon local milksheds. We can thus anticipate tremendous increases in milk production per dairy farm. It is quite likely that, by the turn of the century--just 38 years from now, fewer than 200,000 dairy farms will provide all of the milk necessary for our more than 300 million estimated population.

Technological changes will continue at a fantastic pace and will result in significant changes in dairy husbandry practices, cattle housing systems, production practices, processing procedures, and marketing techniques. A number of you witnessed the birth of the automotive age, of aviation, and of mass production methods. During the life-time of all of you have come developments such as electronics, automation, atomic power, and orbital flight. Can you doubt the future feasibility of "cowpools" consisting of 1000-1800 milking animals in individual comfort stalls, 300-400 stall hospitals, full-time veterinarian staff and laboratory facilities, women handling the milking operations in a number of parlors, and manure fertilizer conversion plants on the premises? Some of these cowpools are already in existence.

We look with new confidence to the direction in which cattle housing systems are moving. After all the new developments have been explored, and future possibilities have become realities, routine, conscientious compliance with old and basic sanitation practices will still be the key to quality milk production. We cannot--we must not--forget this.



CALIFORNIA DAIRY FARM ORGANIZATION AND THE MANAGEMENT  
IMPLICATIONS FOR THE NORTHEAST

Irving F. Fellows  
Department of Agricultural Economics  
University of Connecticut

Dairying is of major importance in the agriculture of California. In 1959, the sales of dairy products totaled \$376 million--12.5 percent of the total value of farm products sold. There were nearly 1 million (945,000) cows kept for milk, and they produced nearly 8 billion (7,974,000,000) pounds of milk.

An industry of this size places California among the leading dairy states in the nation. In 1959, the state ranked sixth in number of milk cows on farms, first in average production per cow, fourth in total milk production, and third in cash receipts from farm marketing of milk and cream. But over-all size is not the only distinguishing characteristic of the California dairy industry. The unique organization and high efficiency of the producing units may well be the outstanding features. These dairymen have earned a wide recognition for the large size of producing units, the heavy dependence upon purchased forage, and the high output per unit of land, labor, and capital.

Great variability exists in California dairying and general average data are misleading. Three major areas exist (1) the Los Angeles area - high concentration of cows on land, practically all forage purchased, unionized labor, factory-type operations (2) the San Joaquin area - desert environment, large units, forage raised, distant markets (3) the North Bay area - family operated dairy ranches, 3 months of pasture, most of rolling hills not adapted to cultivated crops, remaining forage needs met by purchase of alfalfa hay, nearby market with 88% Class I.

Because of the similarities of the North Bay area to Connecticut conditions an intensive study was made of management practices on these farms. The sample represented two strata--those dairymen having approximately 100 cows (Group I) and those having approximately 200 cows (Group II). Physical input-output information and cost data were obtained by personal interview and results were summarized.

Cash outlays for forage was the largest single operational cost per farm, and feed concentrates was second largest. Together, they constituted nearly 60 percent of the average operation cash costs in



both groups. Forage purchases were primarily for alfalfa hay, although small quantities of other hay and green chopped alfalfa were bought. Some of the dairymen grew some oat hay or corn for silage, but, in average terms, less than 10 percent of the hay needs were grown. Pasturage furnished about 30 percent of the forage needs of the milking herd during a three-month period and two-thirds of the total annual forage needs of the replacement stock.

Labor made up 8 percent of cash costs in Group I, the smaller sized herds; and 12 percent, in Group II. In Group I, the operator and his unpaid family workers averaged 55 percent of the total labor force; in Group II, they were 31 percent of the total force. All other cash-operating costs, which include many goods and services required in the milk production process, averaged about one-third of the total cash costs in both groups. Non-cash ownership costs were allocated for the use of fixed productive resources. These accounted for approximately 15 percent of total costs.

Returns were calculated by taking physical outputs and applying average prices and utilization rates. Because of the extensive specialization, milk receipts made up over 90 percent of all income in both groups. Expense and income flows were developed for a representative firm in Group I. For every \$1.00 of income there were cash and non-cash cost of \$0.76 when the values of management and the labor contribution of the owner and his family were not included as costs.

The patterns of forage procurement and use which have developed in California are the results of the interaction of several unique phenomena in the environmental setting of milk production. In brief, these are as follows: certain areas near markets developed dairying at an early period. With population expansion, these dairymen increased in size and, rather than produce their forage, found it more profitable to buy hay from areas opened up to agriculture by development of great irrigation systems and of superior highway transport systems. These new areas were naturally endowed from the standpoint of fertility and topography to grow crops and the opportunity to sun-dry excellent alfalfa hay. With improvements in milk transport facilities, milk production has moved closer to the alfalfa producing areas. But the contractual system in milk marketing, the opportunity costs of agricultural alternatives, and the managerial skills required in efficient milk production have tended to restrain this movement.

Several implications for Northeastern dairying can be derived from observations in the area.



1. A rigorous feeding and health program resulting in high milk production per cow can be achieved with large herds where individual attention of each cow is at a minimum.
2. The benefits of high quality forage in achieving high production rates are great. If forage is grown on the Northeast farm, securing high quantity is imperative. This may mean shifts in types of crops or methods of harvesting. If the latter alternative is considered the cost structure must be examined carefully and large size of units may be necessary to keep unit cost at reasonable levels. If the dairymen must purchase additional feed, the choice of forage substitutes may make it possible to purchase therms of energy at a unit cost level comparable to that of the California dairyman.
3. Major emphasis on the business aspects of dairying has made the California dairyman conscious of this goal. His entire management is based on this criterion. Northeastern dairymen could learn to emphasize business management to an increasing extent.
4. Although the environment has encouraged the attitude, California dairymen have made definite decisions to keep fixed investments as low as possible consistant with optimum labor efficiency and health programs. A major reason for abandoning forage production in the North Bay area was the opportunity to disinvest forage equipment and avoid forage production problems and costs. The scarce amount of capital could then be used to purchase producing cows. Investments in forage handling equipment and buildings in the Northeast must be viewed critically by many dairymen.



PARTICIPANTS IN WORKSHOP

Dairy

Robert Benson, Connecticut  
W. R. Hesseltine, Delaware  
Ralph Corbett, Maine  
Samuel A. Lear, New Jersey  
Edward Oleskie, New Jersey  
Frank Wright, New Jersey  
Richard March, New York  
W. G. Merrill, New York  
S. T. Slack, New York  
Ivan Parkin, Pennsylvania  
S. B. Spencer, Pennsylvania  
Joe S. Taylor, Pennsylvania  
John Atwood, Rhode Island  
Henry Atherton, Vermont  
W. A. Dodge, Vermont  
Edsel Gainer, West Virginia  
Richard Burleson, USDA

Management

George Ecker, Connecticut  
Irving Fellows, Connecticut  
Earl Fuller, Massachusetts  
L. D. Rhoades, Massachusetts  
C. A. Bratton, New York  
Fred Hughes, Pennsylvania  
J. S. Holt, Pennsylvania  
Dwight Eddy, Vermont  
L. M. Vaughan, USDA

Administration

George Whitham, Connecticut  
C. R. Harrington, New York  
M. E. Hislop, New York  
Harry Poorbaugh, Pennsylvania  
R. P. Davison, Vermont

Engineering

Marvin Heft, Connecticut  
Mardis Warner, Maine  
Joe T. Clayton, Massachusetts  
Halstead Colby, New Hampshire  
William Roberts, New Jersey  
R. B. Furry, New York  
R. W. Guest, New York  
Elgin B. Hundtoft, New York  
W. W. Irish, New York  
E. D. Markwardt, New York  
Robert Carlson, Pennsylvania  
Roger Grout, Pennsylvania  
Philip Wilson, Rhode Island  
Curtis Johnson, Vermont  
Andrew Tessman, Vermont  
Robert Gilden, USDA

County Agents

John Elliott, Connecticut  
John T. Nye, Connecticut  
Preston Roberts, Connecticut  
David T. Smith, New York

Consultants

Rodney O. Martin  
William C. Welden  
H. P. Hood & Sons, Inc.  
Irvin R. Fisher  
Co-op. G.L.F. Exchange, Inc.  
C. W. Mellor  
Eastern States Farmer's Exchange  
Irving H. Schlafman  
R. W. Wilson  
U. S. Public Health Service







